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MARC & MARC E Series

Room Combine Systems

For use with MARC Series Designer Software version 3.3.55 or higher

User Manual

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Introduction

Congratulations on your purchase of the Intelix MARC Room Combine system.

This manual covers all aspects of the design, use, installation and programming of the Intelix MARC and MARC E system. Since the MARC system is a unique combination of hardware and software, Intelix strongly advises the installation of an MARC system be undertaken only after the thorough reading of this manual. Customer support is available through Intelix if you encounter problems with your MARC system.

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1.0 System Overview

The Intelix Matrix Room Combine system (MARC) includes a matrix mixer, and may contain a variety of remote control devices known as Intelix Comet Remotes. MARC E provides flexible room combine functions for up to 16 rooms (up to 32 walls), voice paging with autoducking, mic/line mixing per room, keylock security, free setup and control software, front and rear panel com ports, Flash ROM upgrades, as well as serial control via RS232m TCP/IP LAN, and the Internet. The actual room combining can be automatic or manual, toggled through mountable plates, software, or via RS232/IP.

Comet remote controls include Comet Tails (volume control), Comet-4s (source selection), and Comet-8s (room combining logic). A Room Control Station (RCS) combines both the Comet Tail and Comet-4 into a single, convenient remote control station. The system automatically configures all program remote controls to conform to the current room configuration. In the system pictured in Fig. 1a, removing the wall and toggling the room combine station button causes the two room control stations to mirror each other, thus providing two identical control locations in the large room. The single button in the room combine station indicates the presence or absence of the moveable wall.

The hardware components of the MARC System (audio inputs, outputs, zones, and Comet remote stations) are configured and their operations programmed using supplied Windows® based MARC Designer setup and control software. In programming mode you define all audio sources destinations and control locations (stations). Exact functional descriptions, paging levels, routing, remote control personalities, duck level during page and any other parameters of the system are defined in this way. Once the design phase is complete, the file is downloaded into the matrix and the hardware begins to run normally. Changing system functions and altering the existing system is possible at any time (including while the system is in use) using the software.

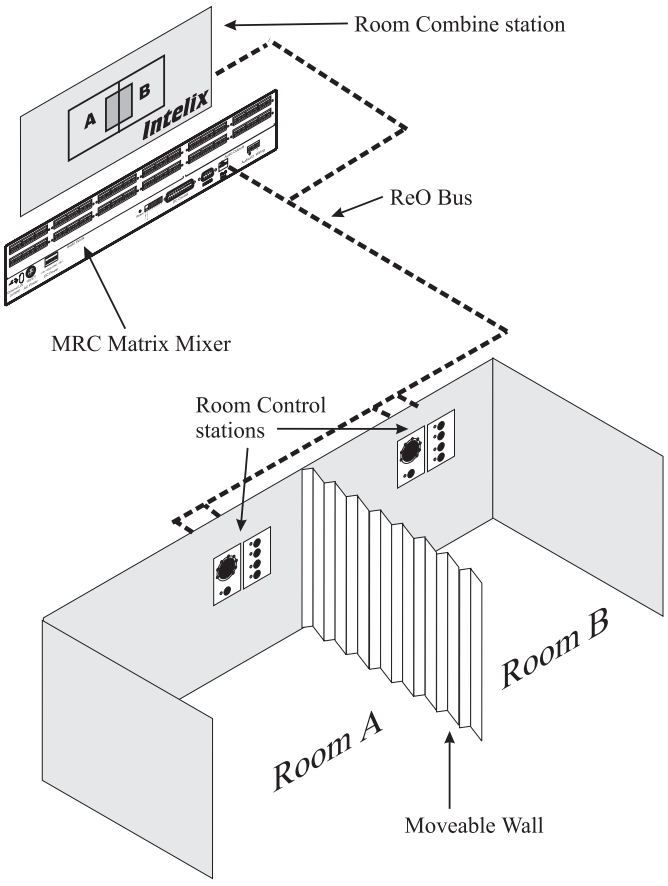


Fig. 1a shows all major components of a room combine system: the room group with a single moveable wall, a room control station in each room, the room combine station and the MARC matrix mixer connected to all stations via the ReO bus. A room group can contain up to 16 rooms.

Fig. 1a Room Combine Components

1.1 Matrix Mixer Overview

At the heart of the MARC matrix mixer is the **application CPU**, which routes data and contains the software controlling the device. The application CPU also contains several "device-level" pieces of information and is responsible for RS232/IP communication. As shown in Fig. 1b, the application CPU off-loads many real-time tasks to other CPUs. These multiple CPUs are tightly coupled to provide real-time processing and fast response time.

The audio crosspoint CPUs route and mix the audio signals from audio inputs and outputs. Because these functions are distributed among several processors, it is possible to perform complex tasks such as independent crosspoint ramping, slewing, and implementing nonlinear response curves. Such tasks are used by the application CPU to implement higher-level functions such as show control, multi-zone paging, and room combining.

The ReO devices are the user I/O interfaces. The ReO bus has its own CPU (the "Communication CPU") which constantly polls the remotes on the bus and reports their status to the application CPU. The remote devices are logically grouped together into "stations", providing flexible, coordinated control locations for paging, audio source selection, and volume control.

The matrix mixer contains an optional PCMCIA card capable of carrying 8 binary inputs and 8 binary outputs. This I/O is generic so that the matrix mixer can interact with custom panels or other pieces of equipment.

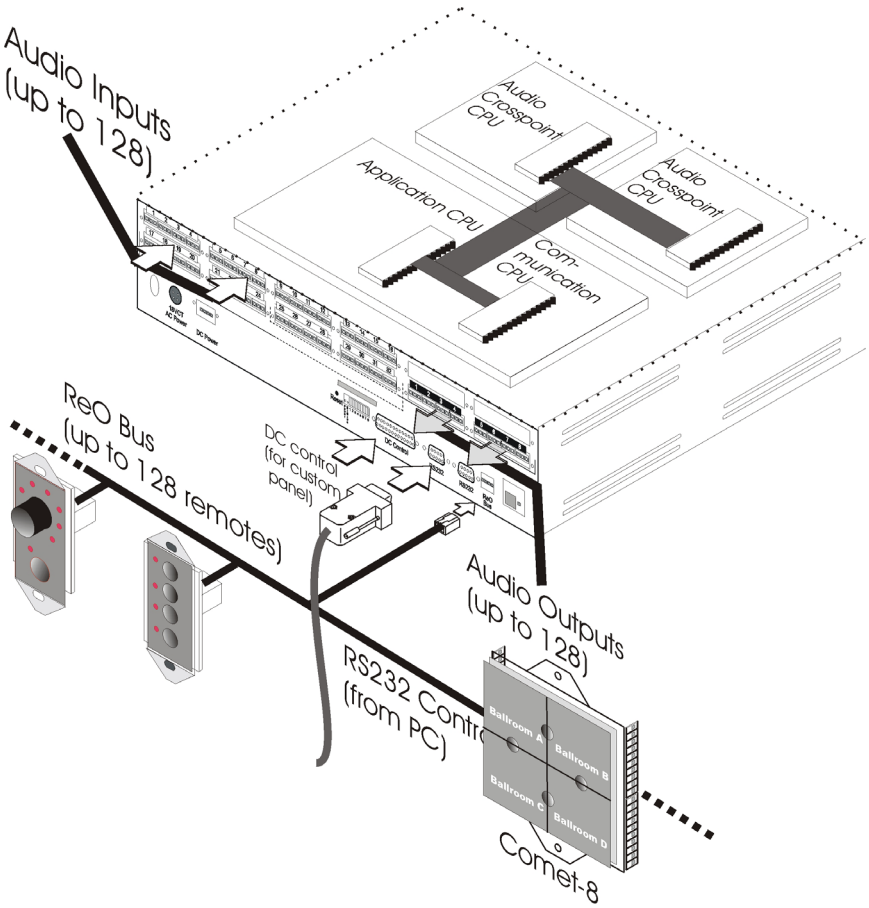


Fig. 1b The Intelix MARC: Matrix System Drawing

Audio Matrix

The audio matrix is the heart of the MARC and is used to route and mix audio signals from multiple sources to multiple destinations. The audio matrix is designed so that *audio inputs can be independently mixed to all outputs simultaneously.*

Each "row" of the matrix represents an individual audio input, whereas each "column" of the matrix represents an individual audio output. As shown in Fig. 1b, a voltage controlled attenuator (VCA) is at every crosspoint and "virtual" VCAs on each input and output, thus allowing maximum control and flexibility.

Following are more detailed drawings of individual crosspoints, showing the parameters available for controlling each crosspoint.

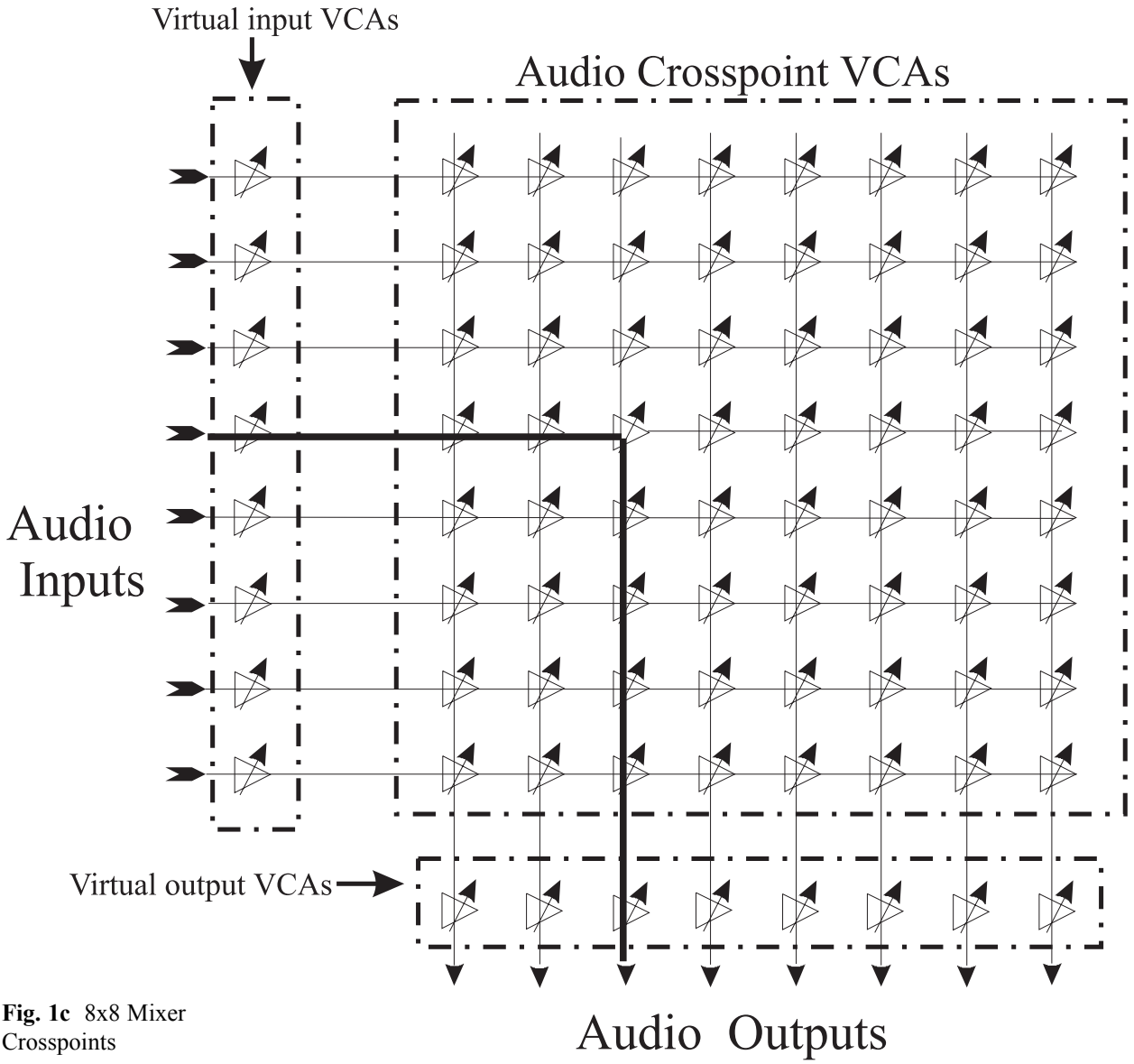


Fig. 1c 8x8 Mixer Crosspoints

Fig. 1d shows how the matrix is actually wired. Each input and output is independent of each crosspoint; i.e., a crosspoint affects only a single input/output pair.

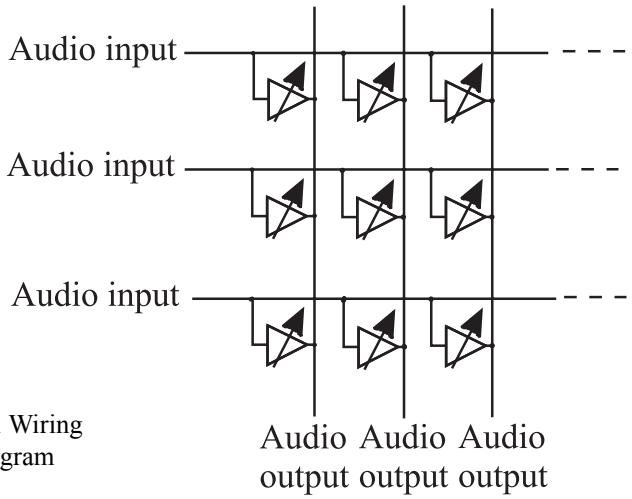


Fig. 1d Actual Wiring Crosspoint Diagram

Fig. 1e shows the typical audio signal path (input 4 to output 3) and the parameters that control each crosspoint in the matrix mixer's grid of crosspoints. Note that each crosspoint has multiple controlling parameters.

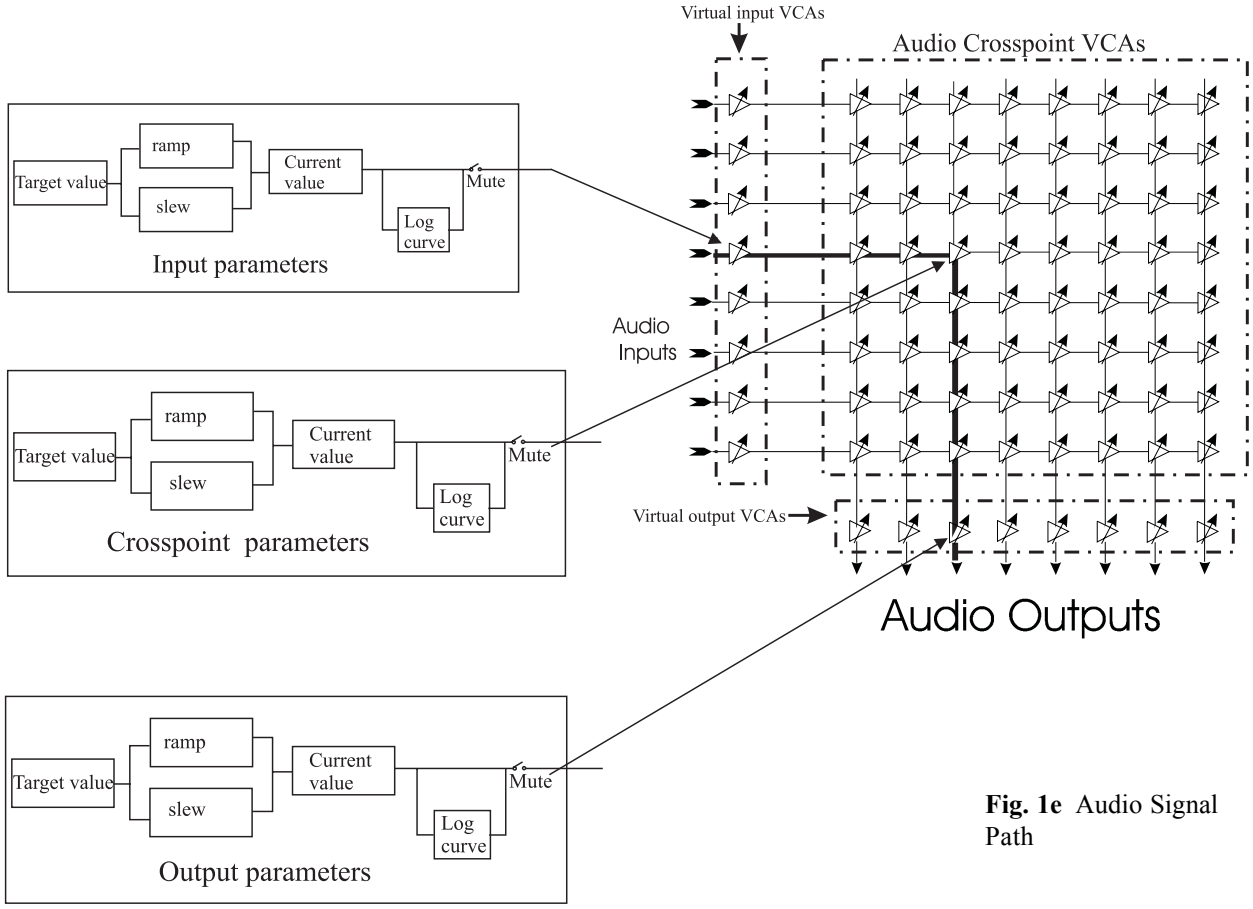


Fig. 1e Audio Signal Path

1.2 ReO Remote Overview

Intelix Comet Series Remotes are single gang control modules for the Intelix MARC system. Typically wall-mounted, Comet remotes function as convenient user interfaces for paging, program source selection, and volume control.

The carefully optimized design allows the Comet remote controls to conveniently interconnect in LAN bus topology. Up to 64 remotes can be utilized with one MARC matrix mixer via ReO bus communication. Each remote's function is then easily assigned using the MARC Designer software's stations screen. The function is easily reassigned as applications change.

1.2.1 Comet remote descriptions

Comet Tail: The Comet Tail is a digital remote control device designed for volume control and mute functions. It has a rotary knob and a single push button.

Comet-4: The Comet-4 is a four button digital remote control device designed for source selection or page routing functions.

Comet-8

The Comet-8 is a rack mounted remote device with eight digital binary inputs and eight digital binary outputs. It accepts contact closures (push-buttons or relays) as inputs and drives outputs such as LEDs, lamps, and relays.

In the MARC system the Comet-8 is used to indicate the presence or absence of walls. It comes equipped with a face plate and switch panel customized for the application. Fig. 1f depicts a panel for a four room system (the Comet-8 is mounted on the rear of the panel). There is a single lit button for each wall; when a wall is in place, its button is pressed and lighted. The MARC system configures the behavior of the Comet-4 and Comet Tail remotes based on the information from the Comet-8.

An alternative to a panel with switches is a set of wall sensors. If you connect a simple contact closure sensor to each wall and connect the sensors to the inputs of a Comet-8, the MARC automatically keeps track of which walls are in place the room groups.

Comet-8s are also used for controlling external devices when configured in a Logic Control Station.

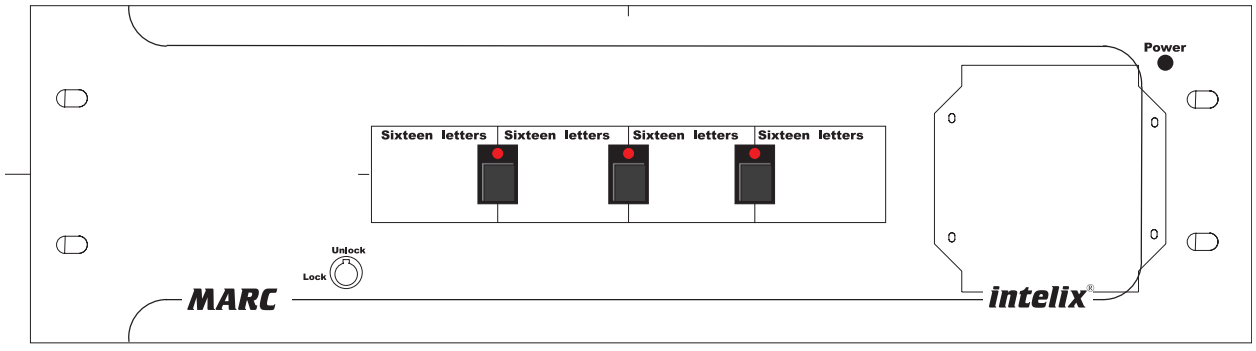


Fig. 1f RC Panel

1.2.2 Station overview

A station is a logical grouping of Comet remotes (Comet-4s and/or Comet Tails). There can be up to 32 remotes in a single station, and up to 64 stations in a single system. The remotes are described in detail in Appendix E.

1.2.2.1 Room combine station

The room combine station has a single purpose: it informs the matrix mixer of changes to the status of moveable walls in the room combine system. This function is performed using Comet-8 ReO remotes for each room grouping. Each moveable wall in the system has a push button, which is interfaced to the Comet-8. When a wall is raised or lowered, its button is pressed, thus alerting the matrix to its status change.

Typically, the Comet-8 has a custom faceplate holding the switches in a template representing the walls. Each switch has a lighted indicator clarifying whether the wall should be considered closed or not. Alternatively, wall sensors provide wall open/close information to the MARC through the Comet-8.

It is also possible to use a custom touch panel as a room combine station. In this case, RS232 messages are used to inform the matrix of status changes.

1.2.2.2 Room control station

The room control station contains an array of ReO remote devices which provide direct user control of audio selection and levels in each room. Typically, a room control station consists of Comet-4 remotes for program source selection and Comet Tail remotes for audio level adjustment.

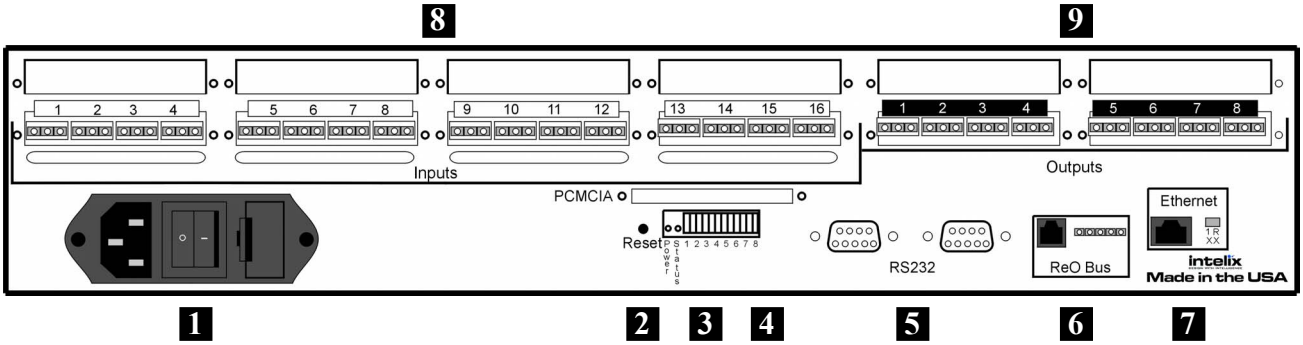
1.3 Matrix Mixer Panels

1.3.1 Matrix front panel

The front panel of the MARC contains one red LED. When lit, this LED indicates power to the matrix. The MARC E matrix also contained a communication port paralleled from the rear.

Fig. 1g The MARC E Matrix

1.3.2 Matrix rear panel



1 **IDE Power Module** - Power status is indicated by the red LED on the front panel. This is the only means of powering down the matrix.

2 **Reset button** - Restarts matrix microprocessors, but does not reset program information.

3 **PCMCIA Card Slot** - Slot for optional Logic Input/Output PCMCIA card featuring 8 logic I/O port pins.

4 **LED/DIP switch position**:
Red LED- when lit, indicates the matrix CPU is powered.
Green LED- function depends upon settings made in software.
DIP switches- "up" position indicates the "on" condition "down" position indicates the "off" condition.

5 **RS232** - DB9, 9-pin (female) receptacle through which the matrix is linked to computer (PC) and other RS232 devices.

6 **ReO Bus** - 6-wire, modular jack receptacle, similar to RJ11 or RJ12, through which the matrix is linked to the ReO remote unit(s). The communication link is synchronous and serial. (2 ground wires, 2 clock wires, 2 data wires). The wiring connections to all the remote units are direct pin to pin. Any new connection **must** have the same pin order to be functional. (See section 12.1.2)

7 **Ethernet Port** - Ethernet port for TCP/IP LAN and Internet connectivity.

8 **Audio Inputs** and **Audio Outputs** - Strips of screw-terminal ("Phoenix-type") plug receptacles (male). Each
9 block accommodates four triplet plugs.

2.0 Quick Start

This section explains two major concepts in brief: how to physically install the MARC system, as well as how to program the required application.

The **Hardware Installation** section takes you from the installation of the MARC hardware components through an audio test of the completed hardware installation. It assumes the job site has been completely and correctly wired.

The **Application Creation** section shows you how to use the installed MARC hardware and Designer software to program and test your customer's application. It assumes your customer's application has been designed and documented.

Fig. 2a shows the basic components and interconnections of a MARC system.

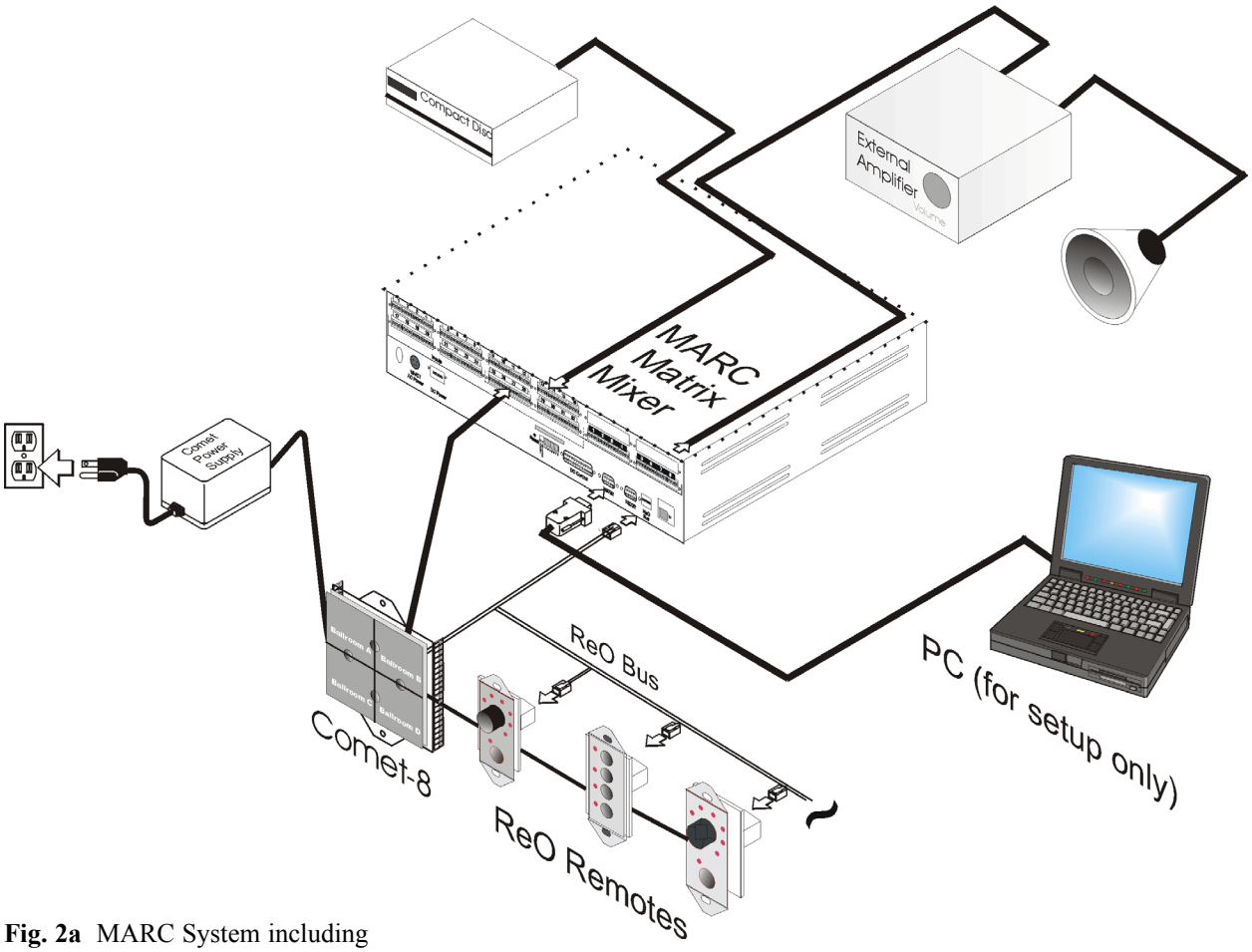


Fig. 2a MARC System including common components

2.1 Hardware Installation

This section guides you from the point at which you begin installation of the matrix mixer and ReO remote controls through an audio test of the installed system. It assumes the job site is wired; i.e., all wiring for the audio and ReO bus is complete. If the building is *not* wired see Section 4.0, *ReO Bus Wiring*.

2.1.1 Mount and power the MARC matrix mixer in the rack

There should be at least 1-2" of free air space on the sides of the matrix mixer for proper ventilation. Do not install directly above a power amplifier or other significant heat source. If you have unusual grounding requirements, consult Appendix B. Ensure that the ReO bus is ***not*** yet plugged into the matrix mixer.

2.1.2 Connect audio sources and outputs

All audio sources and outputs should be connected to the matrix mixer via the (removable) Phoenix connectors on the rear panel. All inputs are line level (except those connected through the optional mic/line card). Paging microphones must be preamplified to line level. Recommended input connection methods are shown in Section 3.4, *Recommended Input Wiring Methods*.

2.1.3 Install remote controls in their assigned locations on the ReO bus

The locations for the remotes should be a part of your design documentation. Install each remote in its correct position. Plug-in the power connection to the remote, verify the LED single blinks at a rate of about once per two seconds. Now plug the ReO bus data connection (the RJ12 plug) into each remote. ***The ReO bus should still not be connected to the matrix mixer.***

2.2 Application Creation

This section guides you from the end of the physical installation section through a final test and balance of the end user's system. For more information, consult Section 6.0, *Auto Design Wizard*, or Section 9.0 for a reference on the MARC Designer Software screens.

2.2.1 Connect the control PC to the MARC matrix mixer

Connect a DB9 cable between your PC serial port and the female DB9 receptacle on the matrix mixer (labelled "RS232"). If using a standard MARC system, the cable should be a "null modem" configuration. If using an MARC E system, the cable should be a straight-through serial.

2.2.2 Install and start MARC Designer software on the controller PC

See Section 5.0, *MARC Designer Software*, for program installation.

2.2.3 Define the system

Use MARC Designer Software to define audio inputs, outputs, and ReO remote stations. For details see Section 6.0, *Auto Design Wizard.*

2.2.4 Connect the ReO bus to the MARC matrix mixer

For the *first time,* connect the ReO bus to the matrix mixer by connecting the ReO bus RJ12 connector into the RJ12 connector on the back of the matrix mixer as shown in Fig. 2b.

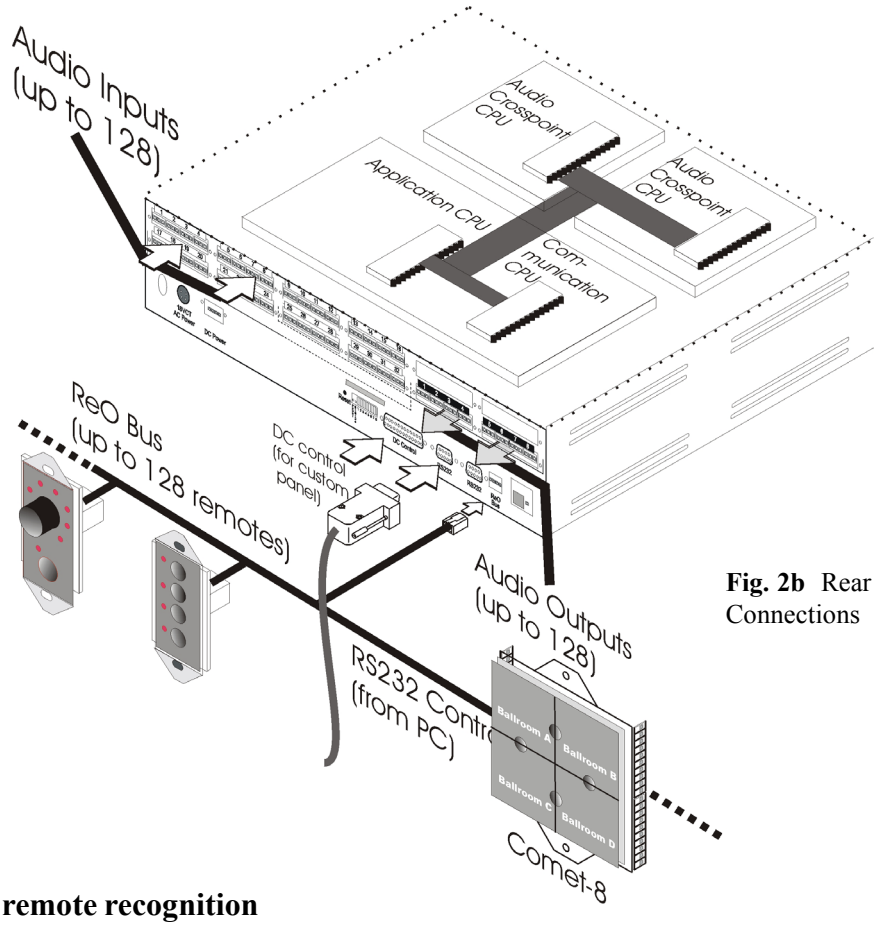


Fig. 2b Rear Panel Matrix Connections

2.2.5 Perform remote recognition

Since your remotes have already been programmed, as required in Section 2.2.3, you may now put the matrix in *Run Mode* and begin testing the system. If you are using *Discovery Mode* for remote recognition, consult Section 8.0, *ReO Bus Modes.*

2.2.6 Define and program the remotes

The programming of the remotes is done through the MARC software and is guided by the definition of remote functions in your design.

2.2.7 Test and adjust the system

To perform a system test you will need to have all audio sources connected and turned on. Also, the MARC matrix mixer *must be in Run Mode*. Testing is done by exercising each remote and verifying proper operation, as well as listening to the audio sources and verifying proper operation through diagnostic software screens (see Section 9.0, *Windows Reference*, for diagnostic screens).

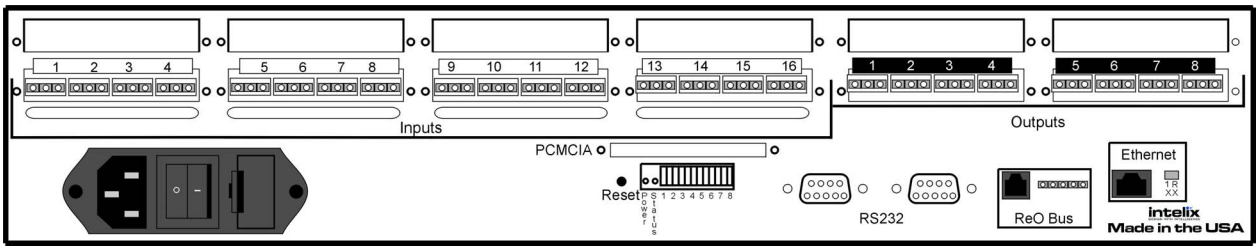


Fig. 2c Matrix Rear Panel

3.0 Matrix Wiring Details

3.1 Mounting the MARC in the Rack

The MARC matrix mixer mounts in a standard width rack. The number of rack spaces required depends on the number of I/Os in your particular matrix mixer (standard configurations are 2RU). Because the MARC generates heat, it is important to meet the following ventilating requirements.

1) Make sure that there is at least two inches of free air space on both sides of the matrix mixer. The mixer's ventilation slots are on the side of the chassis, so a free air column is required for proper ventilation.

2) All matrix mixers larger than eight outputs are equipped with a front-mounted fan. The fan must be unobstructed in the front of the matrix; ensure there are no closeable doors on the rack that might seal the fan from a steady supply of fresh air.

3) Intelix recommends that you not mount the matrix mixer next to a power amplifier or any other source of significant heat. If necessary, leave an empty rack space above and below the matrix mixer.

3.2 Connect the Power Supply

1) Plug the power DIN connector into the back of the matrix mixer as shown in Fig. 3a.

2) Plug the power supply into a standard 120 VAC outlet.

3) The power LED on the front of the matrix mixer should now be lit.

There is no power switch on the matrix mixer. For information on grounding of the matrix mixer, consult Appendix B. For information on using a DC power supply, consult Appendix A.

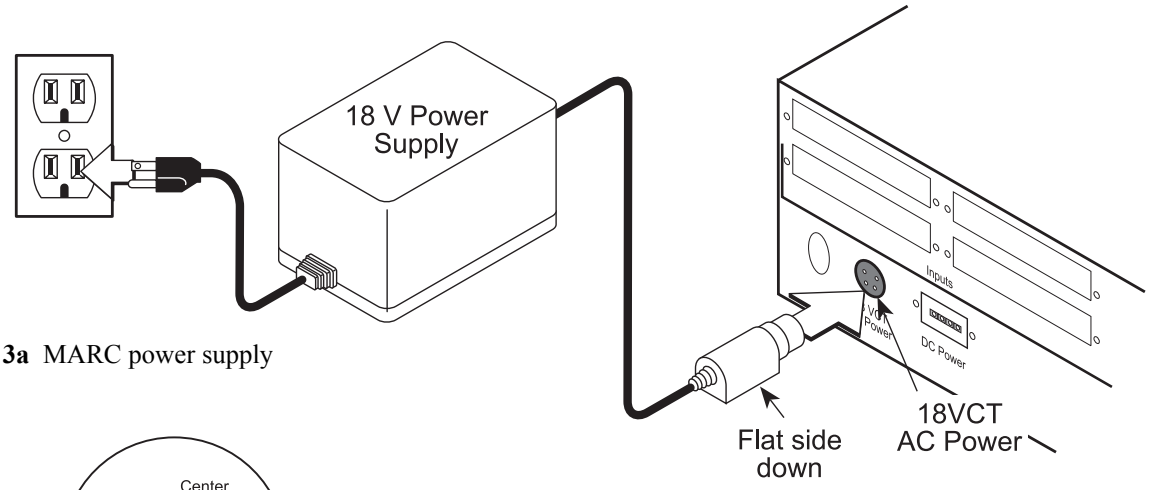


Fig. 3a MARC power supply

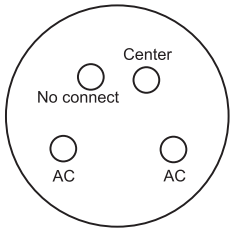


Fig. 3b 4-pin DIN Connector, viewed from the rear of the Matrix

Intelix supplies an 18 Volt, 3.0 Amp center-tapped transformer for powering the mixer. Large matrix mixers may require a larger power supply. If another AC supply is used, it should be of equal voltage and have at least a 60 Volt-Amp rating. The details of the **AC Power Jack** on the rear panel are as shown in Fig. 3b.

3.3 Connecting Audio Inputs and Outputs

3.3.1 Audio inputs

Any line-level audio input can be routed and mixed using the MARC. The inputs are connected to the matrix via removable screw-terminal ("Phoenix-type") plug receptacles. The matrix's audio input can be either electronically balanced (impedance of 20 KΩ) or unbalance to 10 KΩ. The correct method of unbalancing the input is to "float" it; i.e., leave the unused pin open, as shown below.

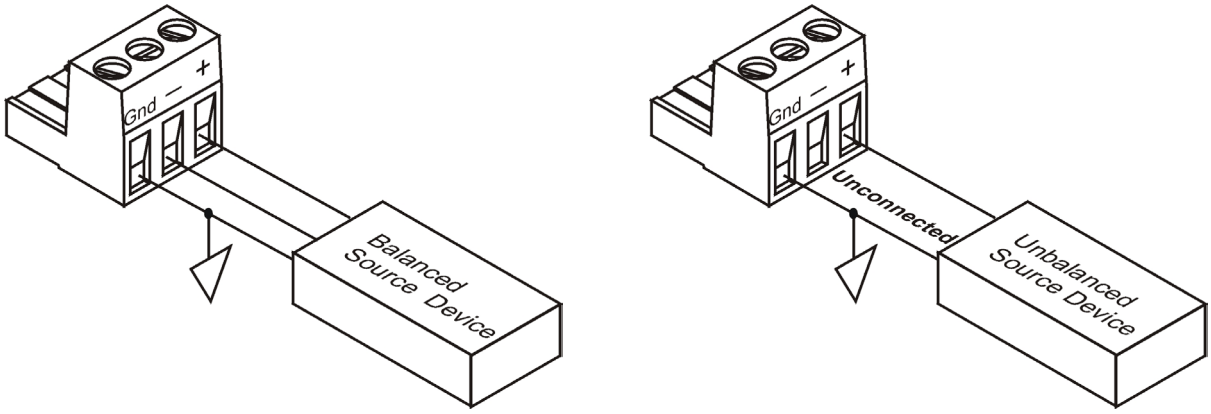


Fig. 3c These drawings show how balanced and unbalanced inputs should be connected to the matrix audio inputs.

3.3.2 Audio outputs

Audio output devices are connected to the matrix via removable screw-terminal ("Phoenix-type") plug receptacles. The audio output from the matrix is electronically balanced (impedance of 440 Ω), but it can be unbalanced (impedance of 220 Ω) by the user. The output can be correctly unbalanced by tying the negative leg to ground, as shown in Fig. 3d.

The matrix will give a 6 dB boost (which compensates for the signal-level loss due to unbalancing) to a signal unbalanced in this way. *Therefore, this method of unbalancing is preferable to floating one side of the pair of leads to unbalance it.*

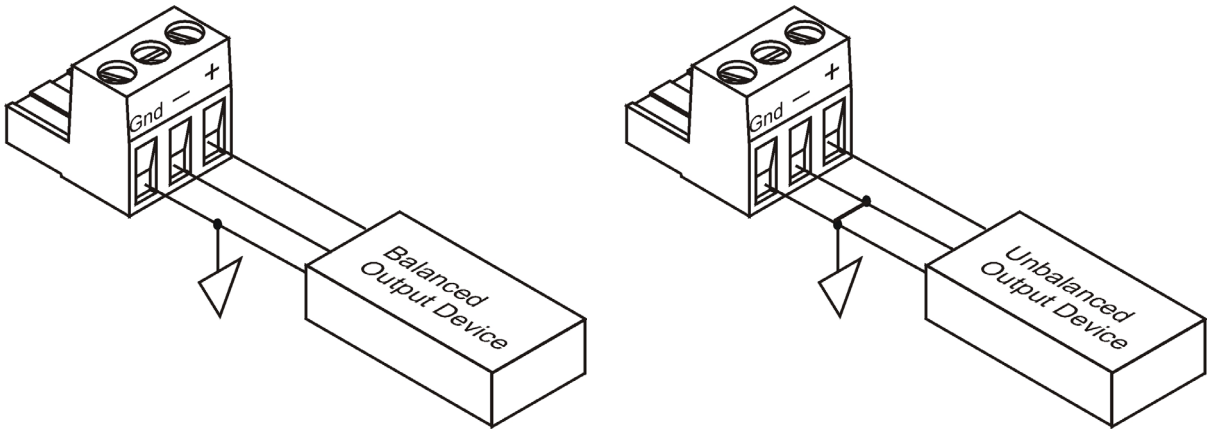


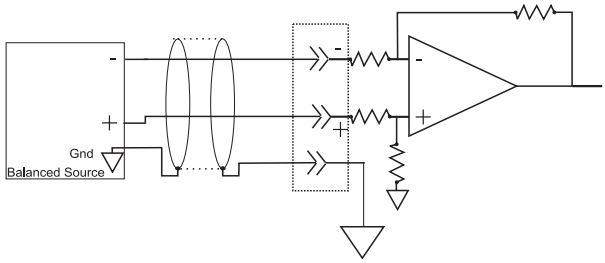
Fig. 3d Matrix output connections for balanced and unbalanced output devices.

3.4 Recommended Input Wiring Methods

The following are the recommended methods for connecting sources to the Intelix MARC. The mixer input is always balanced. From the following drawings, choose the wiring method for your input device (either balanced or unbalanced).

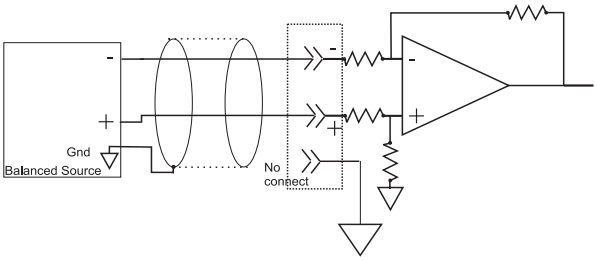
Balanced Source to Balanced Input - normal

Shown below is the normal wiring method for a balanced source device. It has +6 dB gain and excellent ground current and noise rejection.



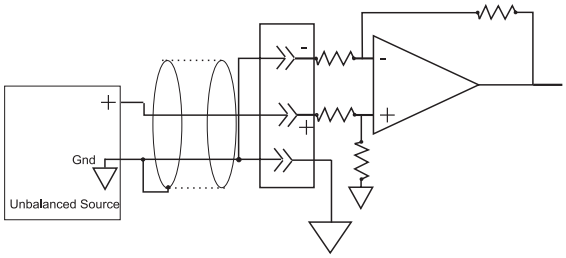
Balanced Source to Balanced Input - method 2

If the method above does not work in your application, use the wiring shown below. This method solves certain ground loop problems, having +6 dB gain and good noise and ground loop rejection.



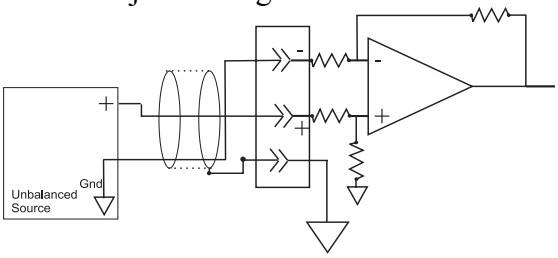
Unbalanced Source to Balanced Input - method 1

For an unbalanced source device, the drawing below shows the best wiring method. This wiring provides a slight (+6 dB) boost, as well as moderate noise and ground loop rejection.



Unbalanced Source to Balanced Input -method 2

For an unbalanced source device, the drawing below shows an alternative wiring method. Because the grounding of the minus input is not to the mixer ground, this method does not provide the +6 dB boost. Ground current and noise rejection is good.



3.5 Connecting the Control PC to the MARC

Before you can program your MARC matrix mixer, you need a personal computer desktop or laptop) capable of running the MARC Designer Software. Although other platforms are supported, Intelix recommends a computer running Windows 2000 or later. Your computer must meet these requirements:

√ PC computer (Pentium 266MHz and 64M RAM or better) with a CD-ROM drive
√ Windows® 2000 or later
√ Serial port connected to RS232 connector (either COM1 or COM2) on the matrix

The wiring diagram for an RS232 cable is at the bottom of the page. The drawing you use will depend on the connector on your PC. Most PCs have either a DB9 or a DB25 on the serial port. The cable wiring for both connectors are shown.

The matrix has two completely independent RS232 serial ports, called COM1 and COM2. Two comm ports enable the user to simultaneously connected both a dedicated controller and a PC running the Intelix software (or any two RS232 devices). There is no restriction on which port is used for any device. Additionally COM2 is mirrored to a third DB9 connector on the front panel for convenience in connecting to a racked matrix. *Only one device can be connected to COM2 at one time.* COM1 and COM2 baud rates are set independently with the rear panel DIP switches. As shown in Fig. 3e, you can also connect your PC directly to the MARC Ethernet port, using a 100baseT crossover cable. If you do this a static IP address is required.

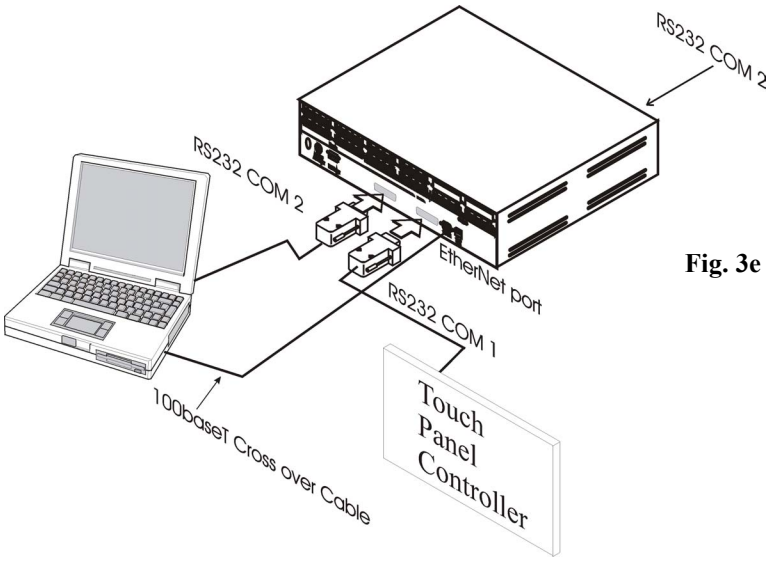
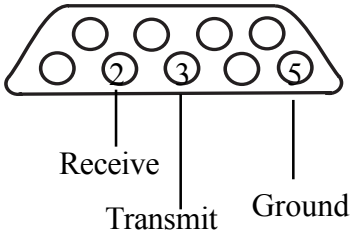


Fig. 3e MARC E connectivity

All RS232 Cables are *straight-through* cables. *Using a null modem cable will cause communication failure!*

Fig. 3f The connections of the MARC's three DB9 connectors for RS232 COM ports 1 and 2 (front and rear).



3.5.1 Communication icons

All MARC screens carry a communication icon in the lower left corner. The icon in the lower left corner will indicate the current state of communication. There are three communication icons:

This icon indicates that the PC is not attempting to communicate with an MARC matrix mixer. In this mode you can create new files and design systems for later transfer to an MARC. In PC alone mode some functions may be disabled.

This icon indicates correct communication between the PC and the MARC. You can transfer files, monitor the MARC or make live real time changes in this mode.

This icon indicates a communication failure. Common causes are incorrect communication port selected, incorrect baud rate, or cabling errors.

3.5.2 Dip switch settings

There are eight DIP switches on the rear panel of the matrix (see drawing below). For all DIP switches, the "up" position indicates the "on" condition, and the "down" position the "off" condition. The function of these switches is shown in Fig. 3g.

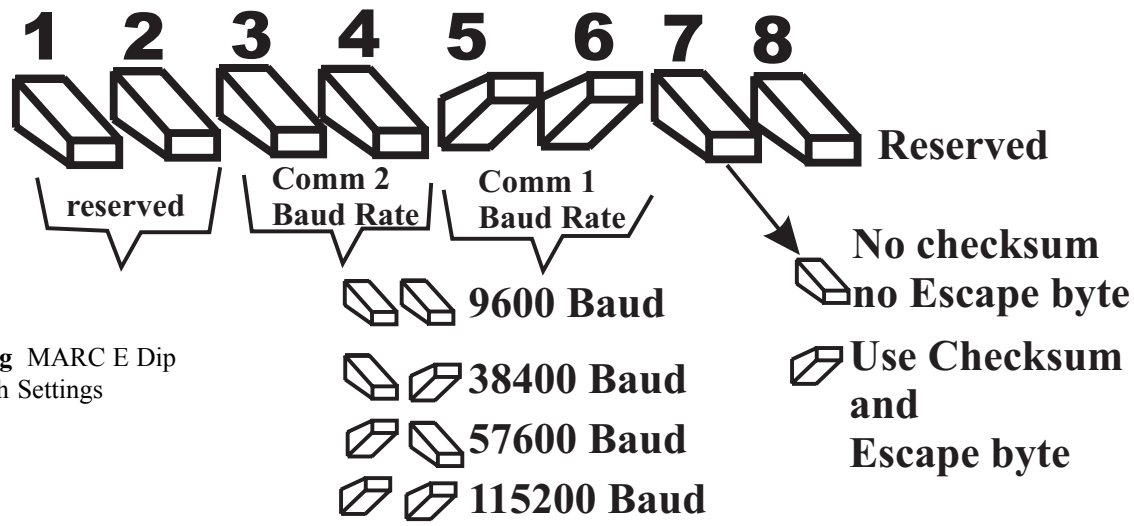


Fig. 3g MARC E Dip Switch Settings

DIP switches 1, 2, and 8 are reserved for use by Intelix.

3.5.3 Baud rate selection

Not all baud rates are available to all revision of the MARC matrices. New matrices support more baud rates than older ones. The baud rates of 9600 baud and 38400 baud are common to both hardware sets.

To distinguish whether you have an old or new hardware, look at the rear panel if there are two DB9 connectors you have new hardware. If there is only one DB9, you have older style hardware. *If you cannot tell which type of hardware you have, use 9600 baud as a default, since all hardware support that rate.*

New Hardware baud Rates

The new hardware supports four baud rates: 9600, 38400, 57600, and 115200.

Old Baud Rates

Older hardware supports only three baud rates: 9600, 19200, and 38400.

Port 2 Baud Rates

DIP switches 3 and 4 set the RS232 baud rate of RS232 port COM 2. *Ports 1 and 2 can have different baud rates if desired.*

Port 1 Baud Rates

DIP switches 5 and 6 set the RS232 baud rate of RS232 port COM 1. *Ports 1 and 2 can have different baud rates if desired.*

DIP switch 7 allows the RS232 checksum and "escape" byte to be toggled on or off. These should be turned *off* in installations which include a permanent RS232 controller, such as AMX, Crestron or custom PC program. The RS232 checksum and escape byte should be turned *on* in installations where the RS232 communication may be hindered because of cable length (greater than 50 feet) or lack of shielding from external electronic noise.

3.5.4 Ethernet connection

The Intelix matrix provides an RJ45 Ethernet connector on the rear panel. To connect the matrix to an Ethernet LAN, connect a cable with two RJ45 connectors to the matrix on one end and to the local LAN on the other. To connect a PC directly to the MARC Ethernet port, use a crossover RJ45 cable made of Cat 5.

4.0 ReO Bus and Comet Remote Wiring Details

This section covers the wiring of Comet remote devices, including data (ReO bus) and power to the remotes. Data and power should be wired with separate cabling to avoid interference.

There are two types of wiring for each Comet: ReO bus data and ReO bus power.

4.1 Installation of the ReO Bus

4.1.1 Wire type

Category 5 (10 Megabits/sec) or better.

ReO Bus Data- this is the data bus for all remote devices, which are serially connected to the matrix ReO port.

ReO Bus Power- ReO bus devices are powered by 9-18V AC or DC.

4.1.2 Connections

Typically, three or four separate cables are used for daisy chaining. One cable will be the *Feed* from the matrix, two or three cables will be *Pigtails* connecting the remotes, and the last cable will be the *Send* to the next wall box.

1) Create a five inch pigtail of Cat 5 with about 1/4 inch stripped on both ends.
2) Insert the stripped ends of the pigtail into the Phoenix data port of the Comet remote. Repeat for each remote.
3) Twist and crimp the Feed, Pigtails, and Send wires together. Dolphin Crimp Connectors are recommended (MCM Part# 95-670).
4) Continue this procedure until all the Comet remotes are connected.

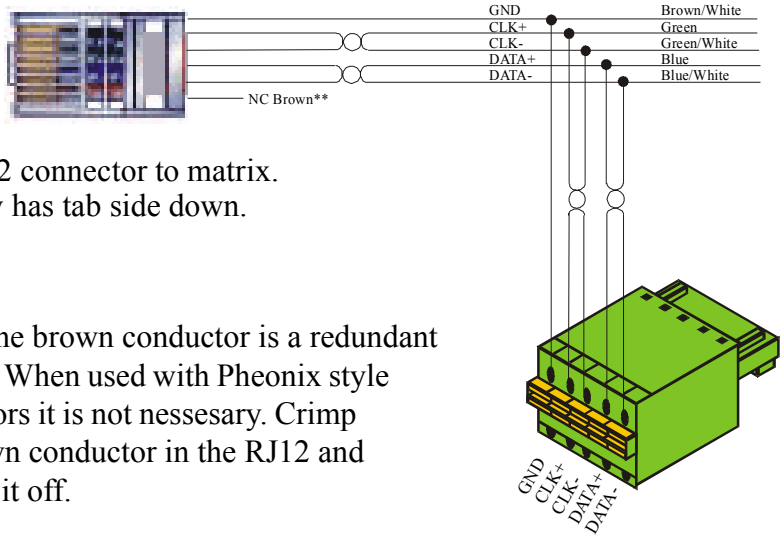


Fig. 4a RJ-12 connector to matrix. View has tab side down.

Note: The brown conductor is a redundant ground. When used with Pheonix style connectors it is not nessesary. Crimp the brown conductor in the RJ12 and then cut it off.

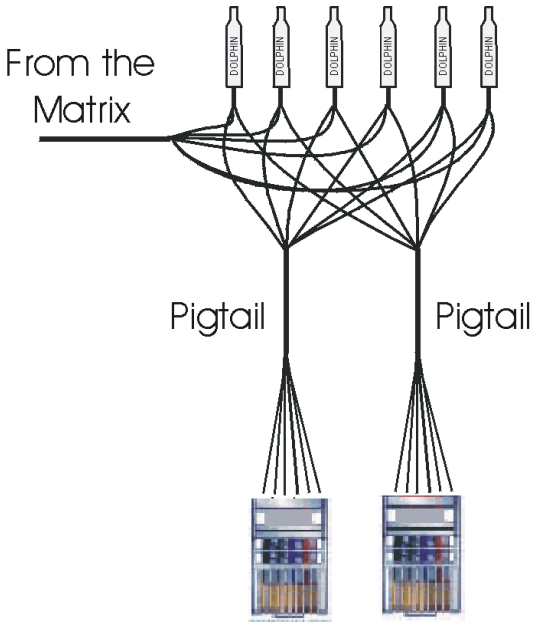


Fig. 4b Pigtail Diagram

Caution: *Take care in stripping the Cat 5. If more than 1/4" is stripped it places excess stress on the bare wire. Also, if the wirestripper knicks the copper, the wire may break easily. There should not be any bare wire showing at the back of the Phoenix connector*

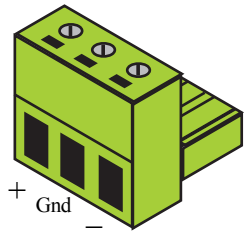
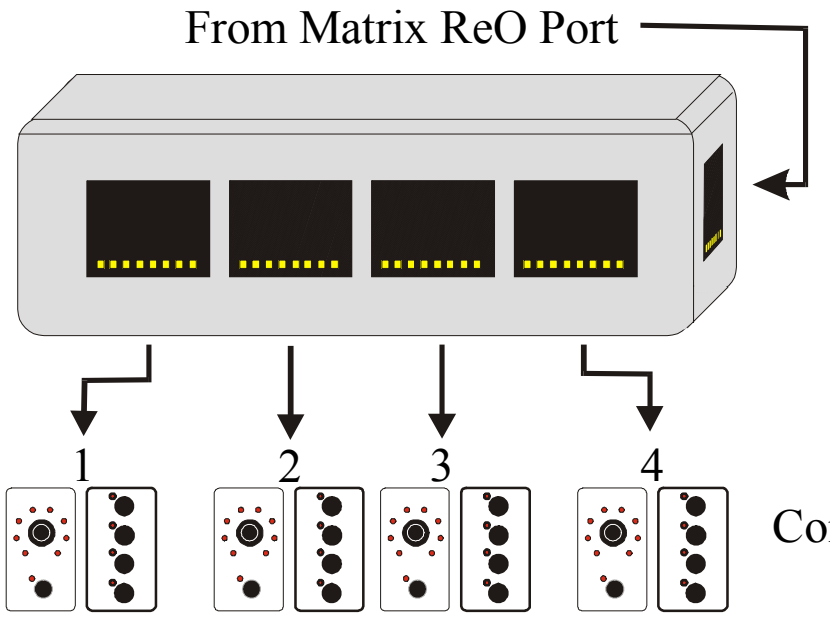


Fig. 4c Comet Power Configurations

Comet-BA4



Intelix recommends using a Comet-BA (Bridge Adaptor) with all ReO bus LANs because it simplifies terminating and troubleshooting. Legs are easily added or removed for programming ease or narrowing down a problematic area of the bus by simply plugging or unplugging modular RJ connectors.

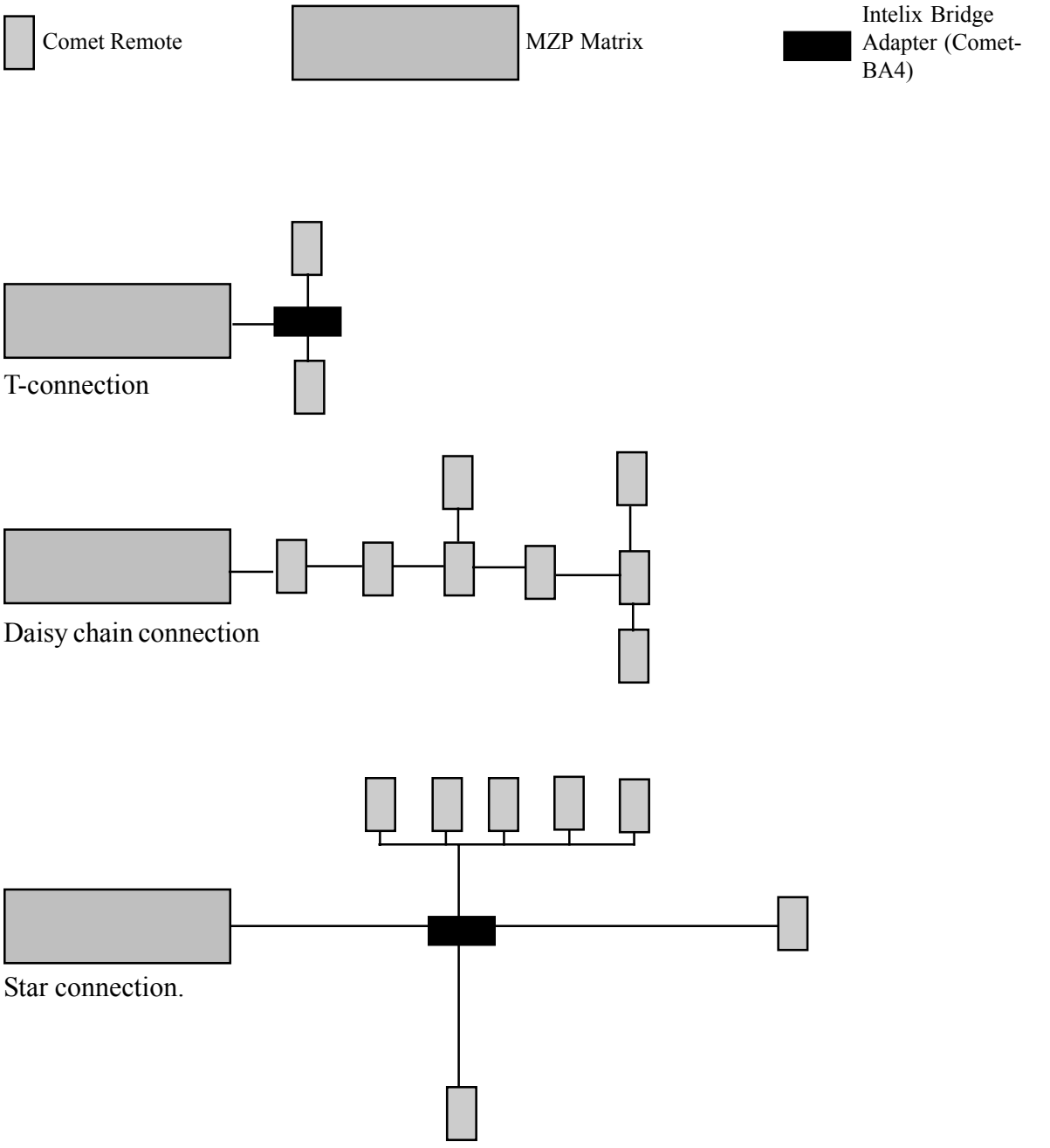
Comets are connected using terminal strips or by daisy chaining. ***The power supply should be plugged into an external source—not the matrix.*** This external supply can be the Intelix Comet Power Supply, or any other transformer with a 9-18 Vrms AC or DC output. It should be distributed with 18 gauge or heavier stranded wire. There should be a minimum of 9 VAC at each remote.

A single Comet device draws 100 mA. Do not load a supply with more than fourteen remote devices.

4.1.3 ReO bus topology

The topology of the ReO bus connections takes many forms, accommodating almost any application. Among the most commonly used forms are T-connections, daisy chains, and star configurations; each of these connection types are shown below.

Note: *Because of its advantages in troubleshooting and maintenance, Intelix strongly recommends using the star topology whenever possible.*



4.1.4 Length of ReO bus connections

The maximum length of total ReO bus possible is 12,000 feet. With a bus length over 3000 feet, reflections become an issue and it may become necessary to terminate the bus at several points, by adding termination resistors as explained below. For bus lengths over 6000, the bus must be terminated.

4.1.5 Reflections

Reflections are returning signals bouncing back from an impedance mismatch on the ReO bus, causing phase cancellation.

Reflection typically manifests itself as intermittent transmission failures in remotes in the middle of long runs of bus. Often the remotes before and after the problem remote will work correctly. Moving the problem remote to a location that is known to work will isolate a remote hardware problem from a bus problem. Some of these symptoms also appear when a bus has excessive noise present. The solution for all these problems is to terminate the bus.

4.1.6 Termination

Termination is a technique for correcting the impendance of a ReO bus to eliminate problems arising from bus reflections and noise problems. Terminating the bus is accomplished by adding resistors at the ends of the bus legs, thus reducing the total impedance of the bus to a level that reduces noise and reflection. The value of termination resistors depends on the topology of the system. In general, the overall impedance of the bus must be lowered to 50 Ω.

4.1.7 Calculate the value of the terminating resistors

N_{legs} = Number of legs in the system. Legs are defined as the number of home runs plus any sub legs over 500 feet..

$N_{remotes}$ = Total number of remotes in system.

X = the resistor value to be added to *each leg* to lower the system impedance to 50 Ω. The equation below yields X. Examples follow.

$$X\Omega = \frac{N_{legs}}{[.02 - (.004545 + (N_{remotes} / 48\ K\Omega))]}$$

After the value for X is found, a resistor of that value across the clock lines and data lines at the remote at the end of every leg must be added. Because the system impedance **must** stay above 50 Ω, the selected resistor you should be the next size *higher* than the theoretical value. These resistors are most easily added at the terminal block where each remote is connected to the bus (shown at right).

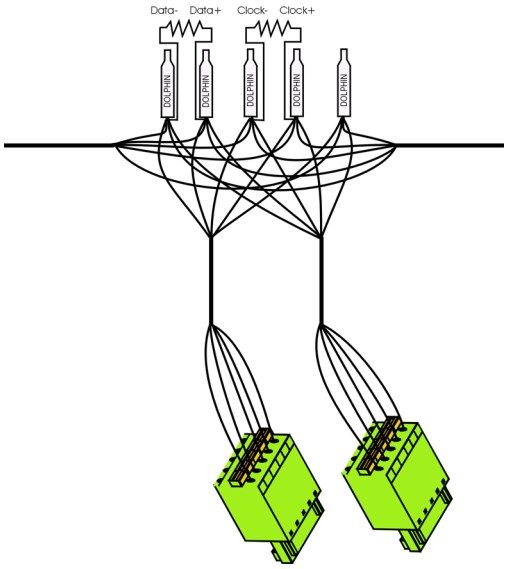
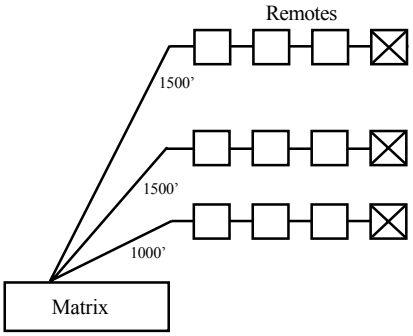
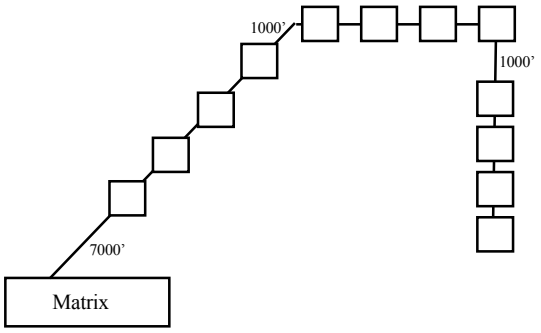


Fig. 4d Comet Resistors

Example 1:
The system has a total length of 4000 feet of ReO bus wire arranged in a star configuration with three home runs.There are four remotes on each run. The number of bus legs is three and the total number of remotes is 12. This bus falls in the range that may require termination. Using these values in the equation of section 4.1.7 results in a resistor value of 197 Ω. Select the next highest standard value 200 Ω. Install the terminating resistors at the remotes marked by an 'X'.



Example 1



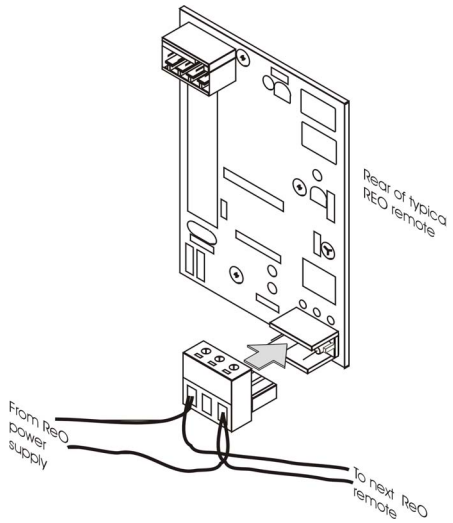
Example 2

Example 2:
The system has a total length of 9000 feet of ReO bus wire arranged in a daisy chain. There are twelve total remotes. The number of bus legs is three and the total number of remotes is 12. This bus *must* be terminated. Using the equation of section 4.1.7 results in a resistor value of 415 Ω. Select the next highest standard value 417 Ω. Install the terminating resistors at the remote marked with an 'X'.

4.2 Power Connections to the ReO Bus

The ReO devices are *not* powered by the matrix. They *must* be powered externally. This power must be 9 to 18 V either AC or DC. It should be distributed by stranded wire, 18 gauge or heavier.

A single Comet device draws 100 mA. A single supply can service more than one remote but some systems may require multiple supplies. The voltage at any ReO bus device must not fall below 9 volts. Multiple supplies can easily be connected using the Intelix three conductor receptacle.



As pictured, both AC and DC can be connected to pins 1 and 3. Either pin may be designated as plus, as the remotes all have full-wave bridge rectifiers. However, for consistency and easier troubleshooting, *all* remotes should be wired in the same way.

Fig. 4e Rear view of the Comet-4 and Comet Tail devices showing Power Connection.

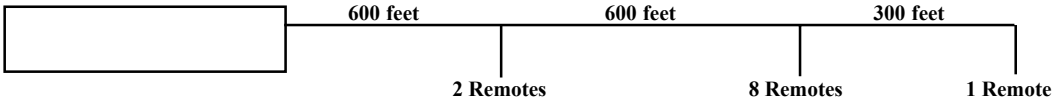
The location of the power supplies with respect to the remotes determines the amount of line loss in the power connections.

Note: If the remotes are located nearer to each other than to the main rack, the line loss can be reduced by locating the power supply closer to the remotes, and not in the main rack. To calculate line loss apply the formula on the next page.

4.2.1 Calculating line loss in the ReO bus power supply

Power Supply Voltage = $\mathbf{V_{loss}}$ + (9 to 18 V)

In most systems, the remotes will be located at various distances from each other and from the main rack. To estimate the loss in such Systems, simply add the losses of the remotes at each distance (e.g., for a system with 11 remotes, 8 remotes at 1200 feet, 2 at 600 feet, and 1 at 1500 feet):



Note: Example is using wire with a resistance of 6.2 ohms per 1000 feet.

V_{loss} = IR = (0.1 A/remote X 11 remotes) (6.2 ohms/1000 ft. X 600 ft.)

+ (0.1 A/remote X 9 remotes) (6.2 ohms/1000 ft. X 600 ft.)

+ (0.1 A/remote X 1 remote) (6.2 ohms/1000 ft. X 300 ft.)

= 4.092 + 3.348 + 0.186 = 7.626 V.

V= Voltage Loss
I= Total Current
R= Resistance of Wire

This sum should always be less than 20 V. If it is greater than 20 V, then the distance between the power supply and the remotes **must** be reduced **or** the wire gauge increased. Otherwise, the voltage experienced by the first remote in the chain will approach the breakdown voltage of the regulator inside the remote.

4.2.2 Grounding the ReO bus

Whether the power supply to the ReO remotes is AC or DC, controlled grounding is impossible if either the data connection (LAN) ground or any of the power-supply wires is shorted to the building or conduit ground. Take care to make sure that such shorts do not occur.

4.2.3 AC power supply

ReO devices are usually powered by a 12 VAC transformer. The transformer secondary is connected *in parallel* to all the remotes in the System at pins 1 and 3 of their power connections. The ground return for the data signals is provided by pins of the Phoenix connector. The remotes' electronics are grounded to the matrix via the *data* connection ground. *This is not connected to the building nor conduit grounds.*

4.2.4 DC power supply

If the ReO devices are powered by a DC voltage supply, and the DC supply has *floating or isolated outputs*, then the grounding connections to the ReO remotes should be the same as for an AC supply.

If *one side of the DC supply output is grounded, care must be taken that the supply ground connection is the same potential +/- 1V as the matrix chassis ground.* This configuration, in the presence of the ground lift jumper, can result in ground loops or large common-mode voltages between the ground of the supply and that of the data connections.

Note: When using a grounded DC supply, the presence of the bridge rectifiers in the remotes will cause there to be a 0.7 V common-mode difference between the DC supply ground and the remote ground. This difference is negligible compared to the common-mode rejection capabilities of the RS485 transceivers.

4.3 Activating ReO Bus Devices

Each ReO remote device required by the installation should be installed in its final location. When doing the initial installation, i.e. before remote recognition takes place, *do not connect the ReO bus* to the remotes.

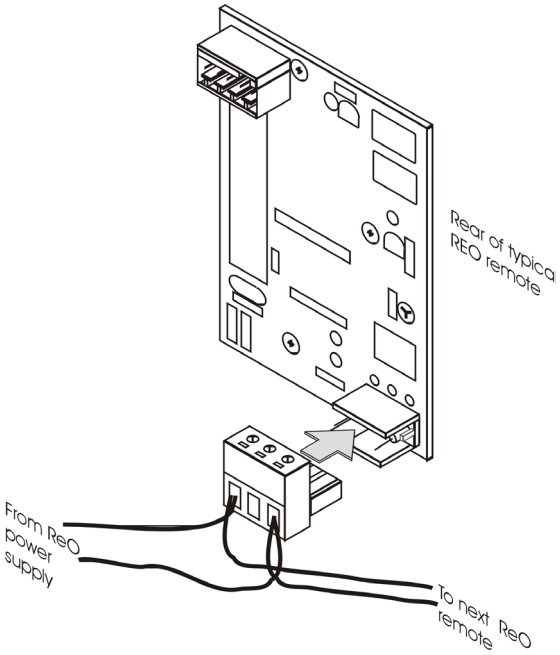


Fig. 4f This drawing shows the back of a typical ReO remote and indicates how to connect the ReO bus power connector. The ReO bus connections are shown for reference.

1) Connect the power connector as shown in Fig. 4f, then install the remote devices in their wall box, panel, or other final destination. The bottom LED on each remote will blink at about once per 2 seconds, indicating the remote has power and has not received a message from the matrix. If the remote does not single blink, troubleshoot the power supply with a voltmeter. The voltage at the remote should be in the range 9-18 VDC or AC.

2) If discovery mode is selected as a remote recognition scheme, or if the remotes are already programmed (either by the factory or on the bench), plug the ReO bus (RJ12 connector) into each remote. ***Do not connect the ReO bus to the matrix mixer yet.***

Note: Because the remotes contain a full bridge rectifier, the power connection can be made with the power plug in either orientation. For ease of troubleshooting, Intelix recommends all plugs be oriented the same way.

4.4 Wiring the Comet-8

The Comet-8 ReO device requires a faceplate and set of switches. There must be one push-button switch for each moveable wall in the system. If your system has more than one group of rooms to be combined, there must be one Comet-8 for each group. Figs. 4g, 4h, and 4i show how to wire contact closures to the Comet-8.

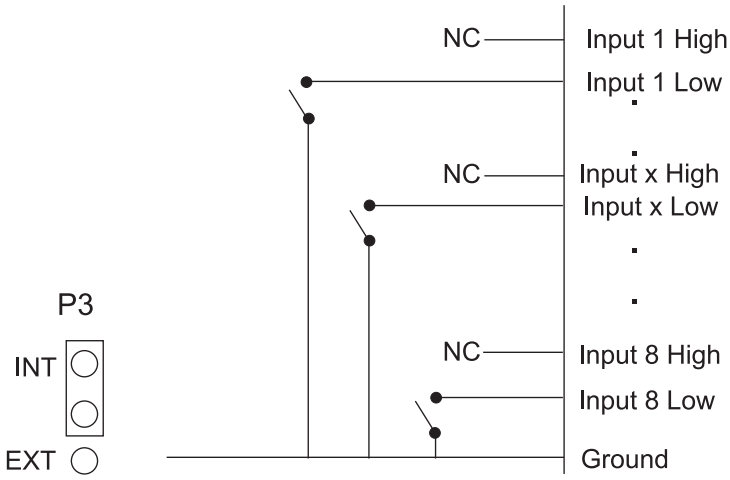


Fig. 4g Non-isolated Inputs: Comet-8 with Contact Closures

Non-isolated Inputs: Fig. 4g shows the correct connections for the Comet-8 using contact closures such as wall sensors. Connect one side of the switch to the input low terminal of an input. Connect the other side of the switch to one of the ground terminals of the Comet-8. Leave the input high terminal unconnected. Be sure the channel's P3 jumper is in place in the internal position.

Repeat this process for each contact closure required.

If you wish to use automatic optoisolation of inputs, you must use an external power supply and connect the inputs. Be sure the channel's jumper at P3 is set to the external position.

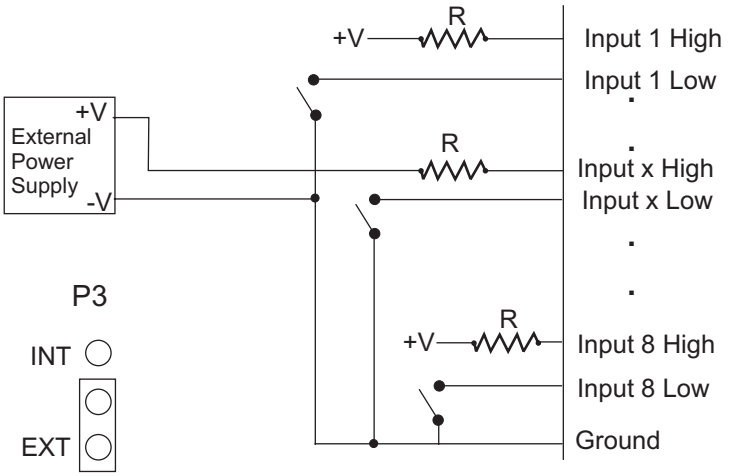


Fig. 4h Isolated Inputs: Comet-8 with Contact Closures

Isolated Inputs: Fig. 4h shows the correct connections for the Comet-8 using contact closures such as wall sensors. Connect one side of the switch to the input low terminal of an input. Connect the other side of the switch to the negative side of the external power supply. Leave the input high terminal unconnected. Be sure the channel's P4 jumper is in position.

Repeat this process for each contact closure required.

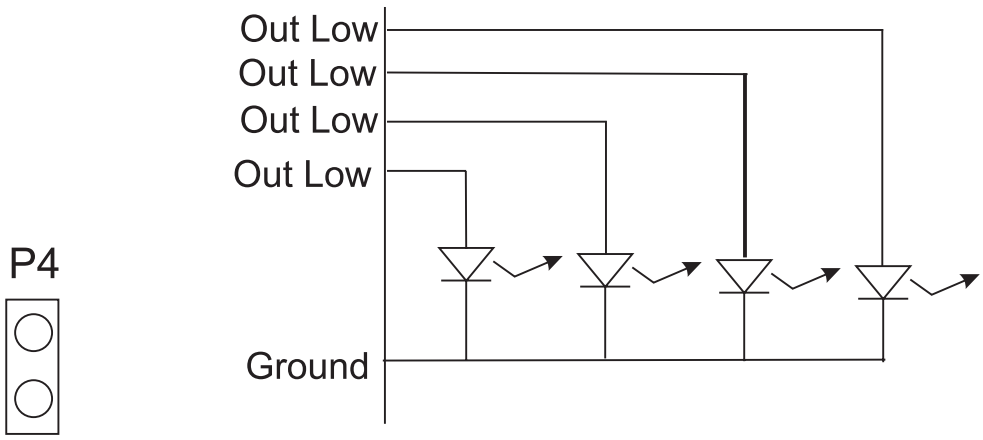


Fig. 4i Non-isolated Outputs: Comet-8 LED Wiring

Outputs (non-isolated): Fig. 4i shows correct wiring for LED outputs on the Comet-8. Jumper P4 for each channel must be disconnected. Relays and logic devices may also be driven with Comet-8 outputs.

4.5 Wiring a Comet-8 for Wall Sensors

When using wall sensors to indicate the open/closed state of walls, the sensors must be wired to a Comet-8 in a specific way. Each sensor is wired to a Comet-8 input low input and ground. The specific pin numbers to wire the sensors to is obtained from the MARC Designer software. After you have designed your room groups and specified them as using wall sensors, print the room group report from the Reports Menu. This report will associate wall sensors with Comet-8 pins.

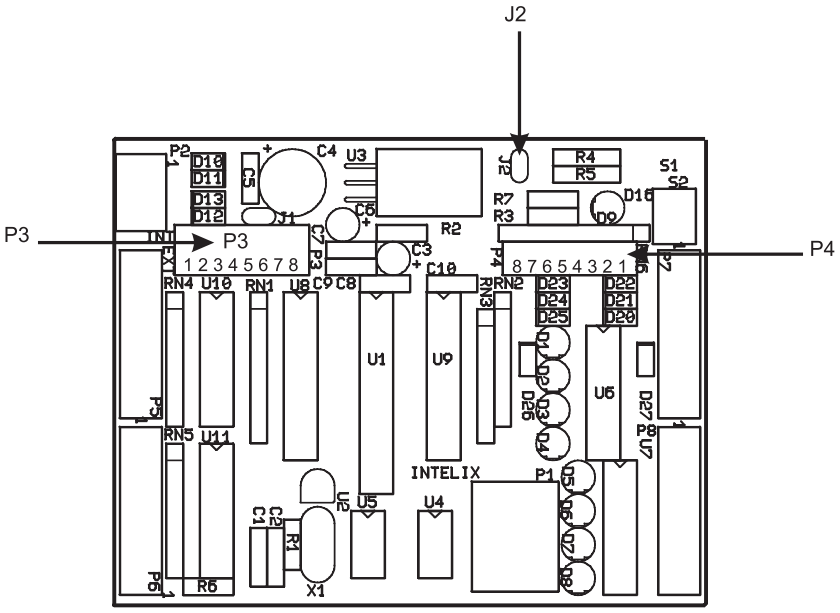
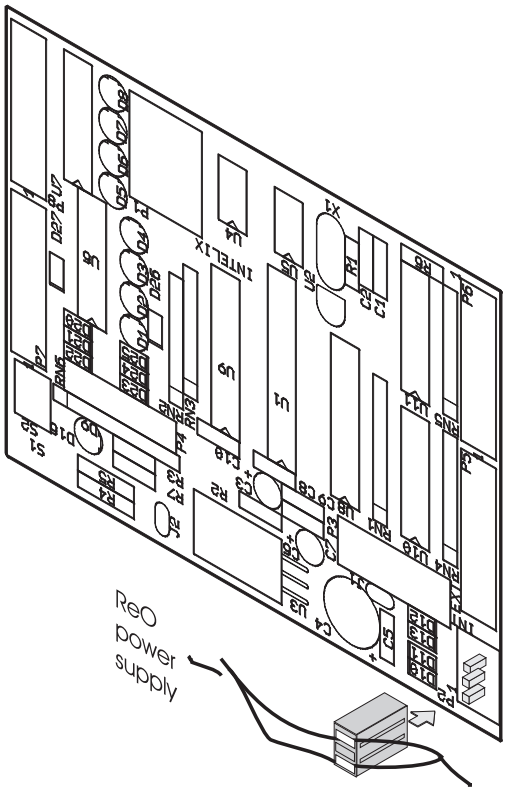


Fig. 4j shows the Comet-8 PCB and the location of jumper block P3. For each channel using a contact closure, the corresponding P3 jumper must be in place. This connects the internal power supply to the selected inputs.

Fig. 4j Comet-8 Jumper Block Location



The Comet-8 has a three pin power connector that is best wired using a Panduit MAS-CON MRT-156F punch down tool.

Fig. 4k Comet-8 Power Connector

4.6 Wall Indicators

If you wish, you can add wall sensor indicators to aid in the correct closure of wall by facility personnel. This indicator is an LED mounted near the wall closure that will be lit if the wall is closed and unlit if the wall is open. A wiring diagram for the indicator is shown in Fig. 4l. The indicator is driven by the output of the Comet-8, whose input takes the wall sensor; i.e., if the wall sensor is connected to Comet-8 input #2, then the indicator will be driven by Comet-8 output #2.

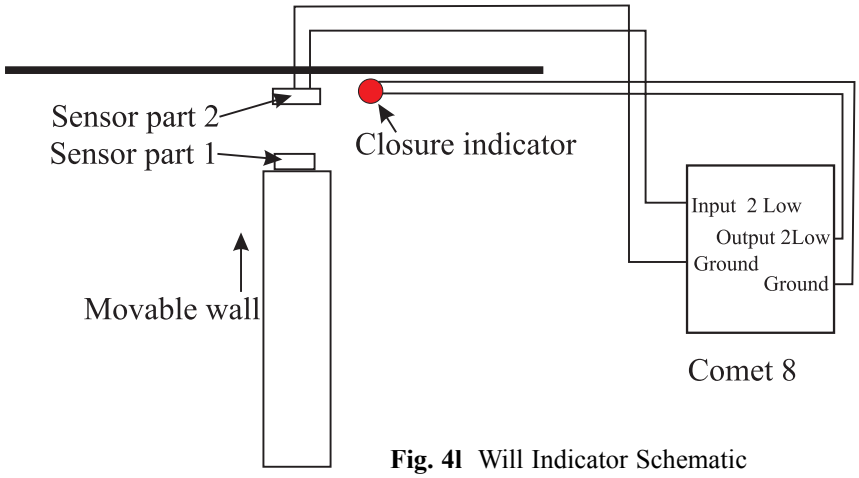


Fig. 4l Will Indicator Schematic

5.0 Installing and Starting the MARC Software

These instructions will guide you through installing and starting MARC Designer Software.

5.1 Installing the MARC Software

1) From the CD or .ZIP file, select and run the file “marc.exe”.
2) From the main screen click on “MARC designer”, then click on “Install MARC Designer Software”.

5.2 Running the MARC Software

Open the MARC software from the Program files option in the Windows Start menu (Intelix MARC). The main screen, as displayed in Fig. 5a, appears.

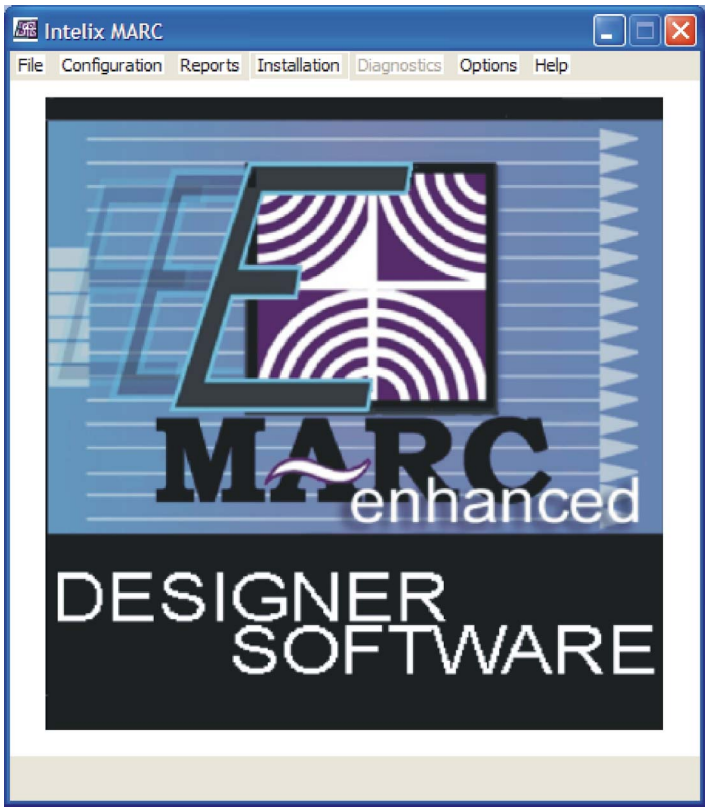


Fig. 5a MARC E Main Window

You must now select an appropriate data source from the following choices:

1) **Existing file:** this presents a standard windows file selection screen from which any existing .mrc file that exists on the PC can be chosen.
2) **New file:** this selection will create a new .mrc file and launch the MARC Design Wizard.
3) **Default file:** this selection will open a factory-created, default software file.
4) **Read device:** this selection connects you directly to the MARC matrix connected to your PC. The communications link must already be established.
5) **Exit:** this selection exits you from the MARC software.

After you make your selection, the main menu of the MARC software will appear.

6.0 Auto Design Wizard

This section walks you through the screens needed to produce a new MARC design. The software automatically begins this design sequence when you select *New File* from the MARC opening screen.

6.0.1 Before using the Auto Design Wizard

Before beginning your design you should determine certain basic characteristics of the design, including the following:

1) **The number of room groups.** A room group is an area that can be subdivided into several rooms with moveable walls. A room group includes all areas included in an open space when all walls are removed.

2) **The topologies of the room groups.** A topology is the physical arrangement of the rooms in a room group when all walls are in place. To see a catalog of available topologies in the MARC system see Section 9.2.1.3, *Changing topology*. If a desired topology is not present in the software, it can usually be added to the software by Intelix. Contact Intelix's Applications Department for details: 866-4-MATMIX or intelix@intelix.com.

6.0.2 Navigating in the auto design wizard

If you have made an error, or wish to change some part of the design while using the Auto Design Wizard, you can move forward and backwards in the Wizard's sequence using the "Forward" and "Back" buttons on each screen.

6.1 Starting the Auto Design Wizard

At the *New File* prompt you will be asked if you wish to run the Auto Design Wizard. Click OK. You will then be guided through a series of topics (some topics require multiple screens).

6.2 Naming the Project

Enter a name for your project. This name will become the default name for the file in which the design is stored at the end of the wizard. The screen below shows the project name screen with the name "Training Facility" filled in. Click the "Forward" button.

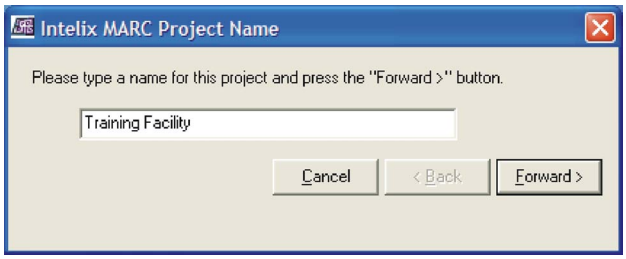


Fig. 6a MARC E Project Name Window

6.3 Room Groups Screen

You will be shown the informational screen for Room Groups. After you have read and understood the instructions, click "Forward".

The room group screen will initially shows two room groups in the design. Two buttons: "Add Group" and "Delete Group" allow you to set the number of groups in your design. To delete a room group, click it (it highlights). Then click the "Delete Group" button. To add a room group, click the "Add Group" button.

After you have specified the number of room groups in your project with the *Add Group* and *Delete Group* buttons, you must specify their topology. The topology is the way that the rooms are arranged in the group. Select a room group by clicking on it (it highlights). Then click the "Change Topology" button. You will see a catalog of all room topologies available to your system. Select the correct topology by clicking it. Then click OK. Repeat these steps for each room group in your system.If a desired topology is not present in the software, it can usually be added to the software by Intelix. Contact Intelix's Applications Department for details: 866-4-MATMIX or intelix@intelix.com.

There can be up to eight room groups as desired with any topology so long as the total number of walls does not exceed 16. A wall counter at the bottom of the screen helps you keep track of how many rooms you have specified.

If you make changes that you wish to reverse, click the *Cancel* button.

When you have selected the correct number of room groups and set their topologies, click the *Forward* button.

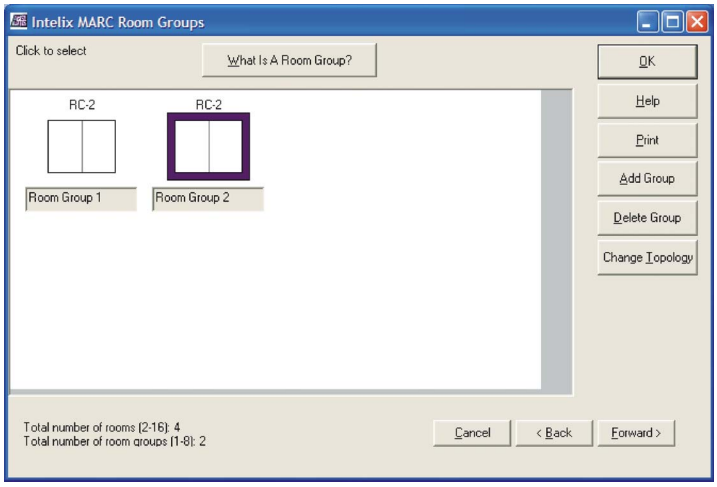


Fig. 5b shows the room group screen with a single room group in place. The *Delete Group* button has been used to remove the other default group. The remaining group has the default group name and topology.

Fig. 6b MARC E Room Group Window

Fig. 5c shows the topology catalog that appears when you click the "Change Topology" button. A four room topology is shown highlighted.

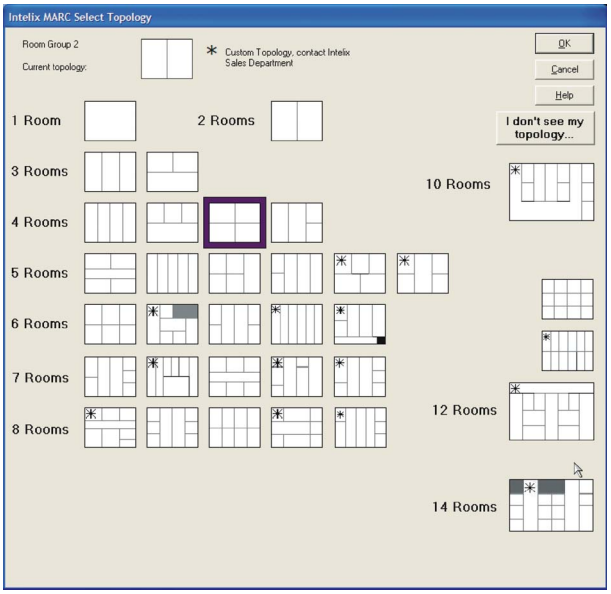


Fig. 6c MARC E Topology Window

6.4 Room Name Screen

The next screen will be an instructional screen for MARC room names. After you have read and understood it, click the *Forward* button. You will see the Room Name Screen as shown in Fig. 6d.

The room combine station contains a Comet-8 remote which interfaces the wall switches to the MARC matrix. MARC then keeps track of the wall configuration at all times, enabling it to correctly configure the audio control for each room.

At this stage of the wizard, all that is required is that you name each room in each group.

When you have finished naming the rooms, click either the "Room Details Template" button (if your rooms controls are similar) or the "Individual Room Details" button (if your room controls are different).

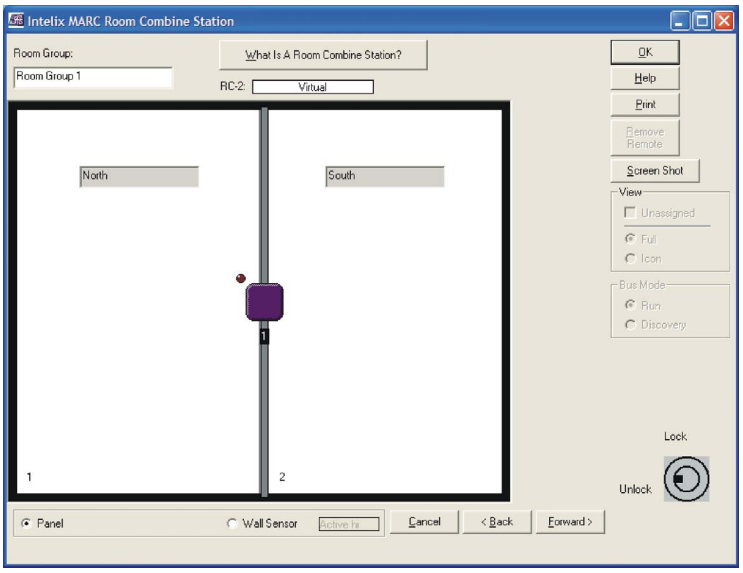


Fig. 6d MARC E Room Name Window

6.4.1 Assign names to rooms

Click in the name label (initially containing a default name) and type the new name. Make the name as descriptive as possible within the twenty character limit.

6.4.2 Printing the room combine station screen

For your documentation convenience, a *Print Screen* button is provided on this screen. It sends your room combine configuration to your local printer.

6.4.3 Changing the room group name

To change the name of the room group, click in the text box labelled "Room Group" and type the new name.

6.4.4 The *what is* button

To learn more about room combine stations, click the button marked "What is a Room Combine Station".

6.4.5 Panel/wall sensor selector

At the bottom of the room combine station screen are two selection buttons: panel and sensors. If your design uses a room combine panel, make sure the "panel" check box is checked. If instead you are using wall sensors to directly sense the up/down state of walls, check the "sensors" selection. If panel is selected you may then choose the "mirror" option which creates a parallel panel for control from dual locations. This second panel may be chosen to have Comet-8(s) only to provide external triggers to Crestron or AMX style controllers. If "Wall sensor" is selected, you may select the polarity of the sensor by double-clicking the "polarity" control.

6.5 Program Sources

This screen allows you to specify the number of program sources your design requires. A program source is an audio source that is available to all audio outputs in the design. Usually program sources are background music.

Use direct text entry or the up/down arrows to set the number of program sources.

Fig. 6e MARC E Program Source Instructions Window

6.5.1 Naming program sources

To change the name of a program source, click on the name to be changed, type the new name, and press *Enter*.

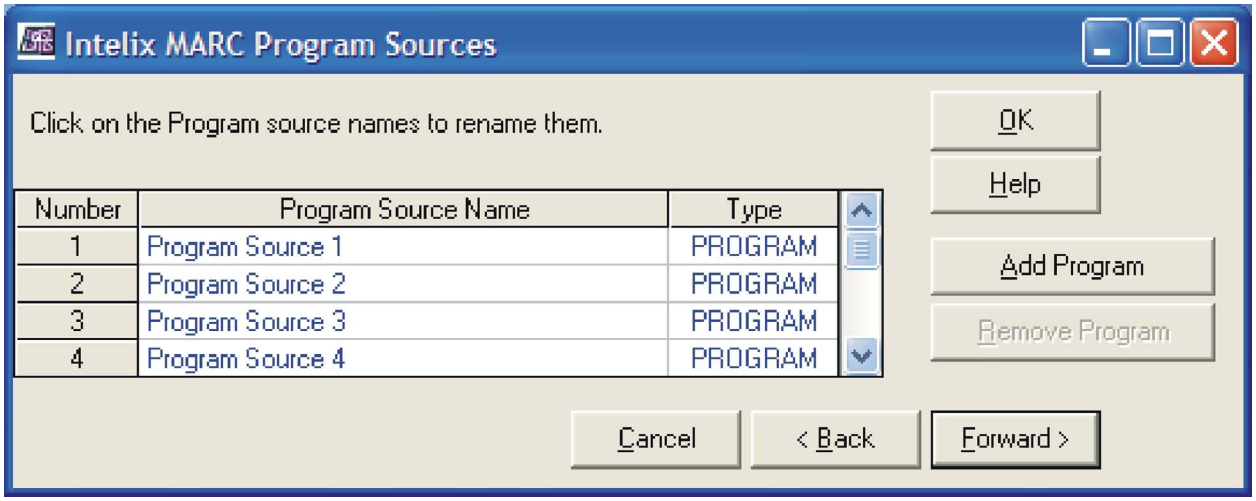


Fig. 6f MARC Program Sources Window

6.5.2 Adding/deleting program sources

To add a program source, click the “Add Source” button. A new program source with a default name will appear. Change its name as desired. To delete a program source, select the source by clicking it, the click the “Remove Source” button.

6.6 Room Details

The next screen is an instructional screen for room details. After you have read and understood it, click either “Room Details Templates” or “Individual Room Details”. If a number of rooms in your design have similar room details, click the “Room Details Template” button. Fill out the template with the details for your design.

If your design has little similarity among room details, then go directly to “Individual Room Details” without using the template feature.

Fig. 5g displays the Room Details screen. This screen is the same whether you get to it from the Template or Individual button.

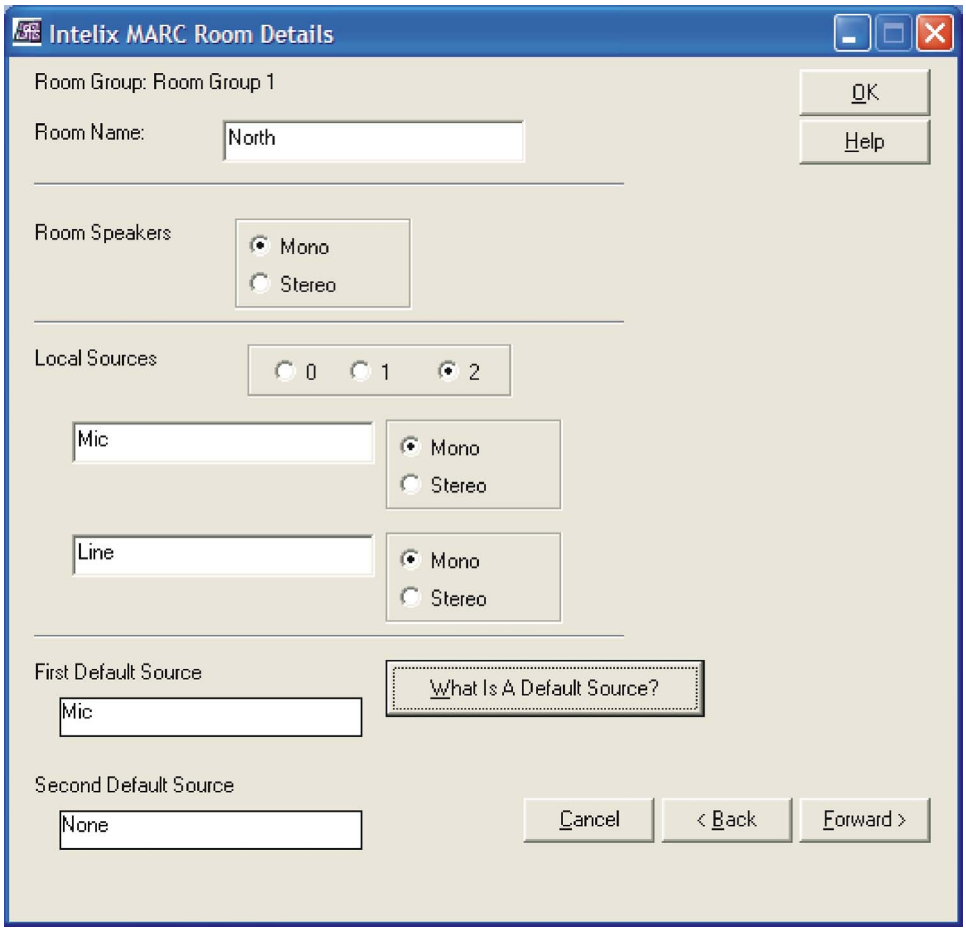


Fig. 6g MARC Room Details Window

6.6.1 Naming the room

Click on the Room Name text box and enter the name of the room. *Note that this name is different than the name of the room group.* This screen is the place to name the individual room.

6.6.2 Mono/stereo

This selection box determines whether this room will have stereo or monaural audio routed to it. Click on the desired selection.

6.6.3 Local sources

A *local source* is an audio source that originates from the room itself, such as a microphone. When an audio source is specified as a local source, it is unavailable to other rooms. While it is possible to change a local source to a program source you should decide carefully in advance which sources will be local. Usually, local sources are the microphone and line jacks in the room.

6.6.3.1 Number of local sources

Each room can have 0, 1, or 2 local sources. Click the appropriate selection button for your room. If more local sources are required, Intelix recommends placing a mic/line mixer before the matrix.

6.6.3.2 Characteristics of local sources

After you have selected the number of local sources for the room, the correct number of name boxes will be available on this screen. Enter the names of the sources.

Next to each name box is a selection for mono/stereo of each local source. Select the appropriate choice.

6.6.4 Default sources

A default source is an audio source that is turned on to a given room whenever a wall is moved. This provides audio to rooms, including rooms that do not contain a Comet-4 for selecting audio sources. The level of the default source is determined by the setting of the lowest Comet Tail among each of the rooms that this room is combined with. Each room can have up to two default sources. If a room has two default sources, the two sources will be mixed. Select a source from the pick list provided. The list contains all program and local sources, any of which can be a default source for this room.

6.7 Paging Sources

MARC supports two types of paging sources: normal and emergency. They differ only in priority level. A normal page ducks (reduces in volume) all program sources during the normal page to make the page more audible. The emergency page mutes all other audio sources – including normal pages – for maximum audibility. Clicking respective check boxes includes/excludes either or both audio types depending on design requirements.

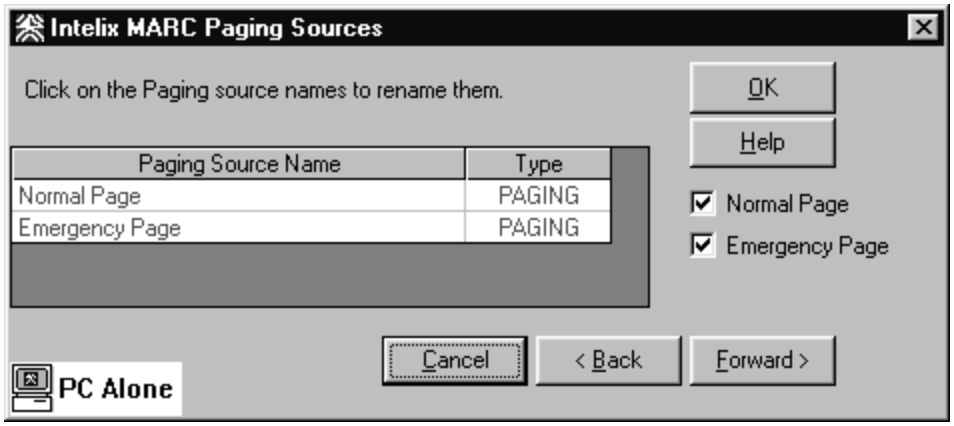


Fig. 6h MARC Paging Sources Window

6.7.1 Naming paging sources

To name or rename a paging source, click on the name to be changed, type the new name, and press *Enter*.

6.8 The Room Control Station Screen

Room Control Instruction screen is the next screen in the design sequence. After you have read and understood it, click on either the "Room Controls Template" button or the "Individual Room Controls" button.

Both paths lead to the same screen as described below.

If a number of rooms in your design have similar room control station, click the "Room Control Template" button. Fill out the template with the details for your design. Now click the "Individual Room Controls" button on the template screen to step through each room individually. There you can alter the controls for rooms that do not exactly match the template.

If your design has little similarity among room control stations, go directly to "Individual Room Details" without using the template feature.

The room control station defines which controls are available to the user in each room of a room group. Each room can have different controls if desired. An individual room control screen is shown in Fig. 5i.

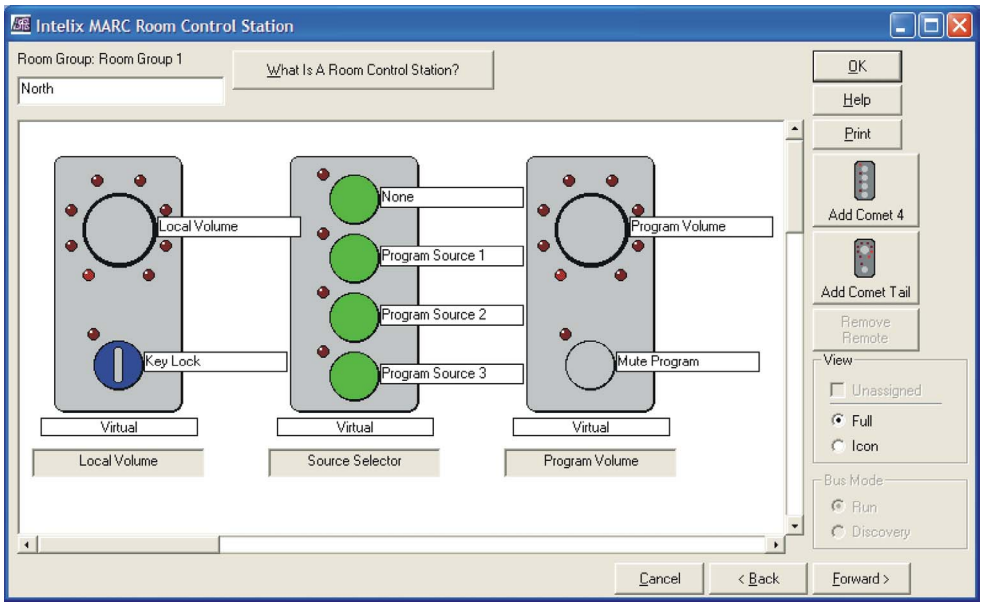


Fig. 6i MARC E Room Control Station Window

6.8.1 Adding/deleting remotes

To add a remote to the room control station, use the "Add Comet 4" or "Add Comet Tail" buttons.

To delete a remote, highlight the remote by clicking on it, then click the "Remove Remote" button.

6.8.2 Remote viewing options

The remotes in a station can be viewed in two ways: full or icon, icon being a smaller version of full. In a station with a large number of remotes, you may wish to use icon view so that all the remotes are visible.

6.8.3 Unassigned view

When you select the “unassigned” viewing option, the window splits into two panes. The right pane shows the physical remotes in the system that have not yet been programmed. The left pane shows the virtual remotes you have programmed in your design. Both full and icon view will work in unassigned view. You will wish to use unassigned view option when transferring programming to your physical remotes.

6.8.4 Other Room Control screen features

The button “What is a room control station” explains the details of a room control station. The *forward* and *back* buttons allow you to maneuver through the design wizard. The *print* button generates a printable report. The communication icon reflects the state of communication between the matrix and the control PC. The screen shot button sends the screen to your local printer.

6.9 DC Control Screen

The DC control screen displays the current configuration of paging inputs and destinations on the DB25 connector on the rear panel of the MARC. The DC input pins 1-8 can be configured to trigger pages into arbitrary destinations, and the DC output pins can be configured to drive external devices (LEDs, relays, logic, etc.).

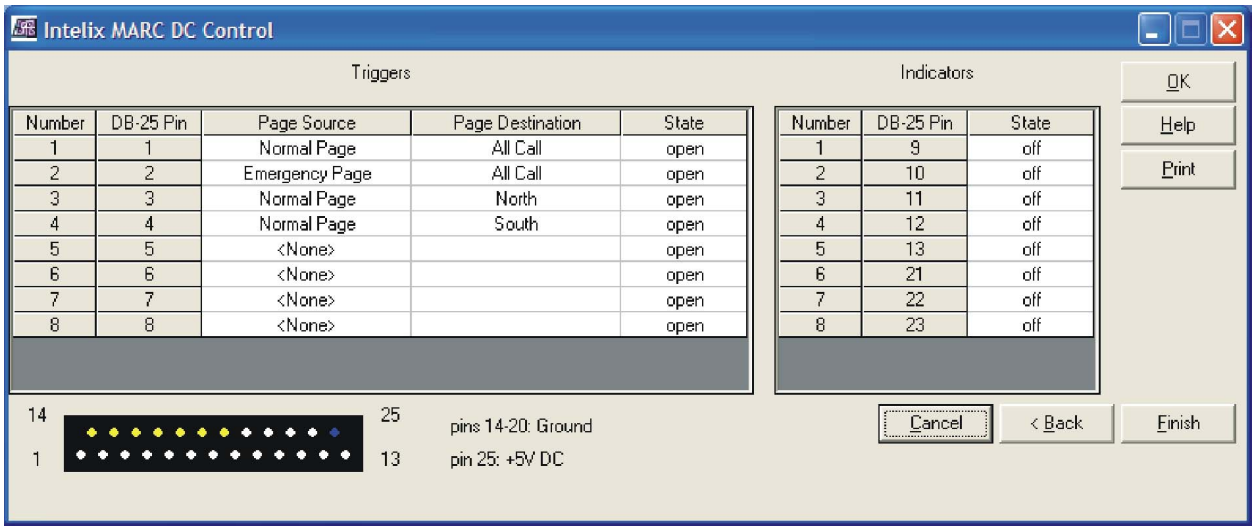


Fig. 6j MARC E DC Control Window

6.9.1 Number and DB25 pin columns

There are eight page trigger inputs numbered 1-8, and eight output indicators numbered 1-8. Each trigger and each indicator is wired to a specific pin on the DB25 connector. This pin is shown in the DB25 pin column on the DC Control screen

6.9.2 Page source columns

The page source column allows the selection of any or none of the two paging sources. A pick list containing “none”, “normal page”, or “emergency page” appears when you doubleclick the page source column.

6.9.3 Page destination columns

The page destination column routes the page to any or all rooms in the design. If rooms are combined that have a page routed to them, they will both receive the page routed to either.

6.9.4 Page trigger state column

If your PC is connected to a MARC matrix mixer, you can simulate a trigger closure by double-clicking on the trigger’s state column. This acts exactly as if you had pressed a contact closure on that trigger pin. You can thereby simulate a trigger activation even before the contact closure hardware is in place.

6.9.5 Indicator state table

If your PC is connected to a MARC matrix mixer, you can activate an output indictor by double-clicking on that indicator’s state column. This enables you to test DB25 connecter to external devices wiring.

6.10 Finish the Auto Design Wizard

You have finished the MARC Auto Design Wizard. You are prompted for a name for your project. The default name is the name you gave the design in its first screen. After you have saved the project to file, you are given the choice of returning to the main MARC menu, checking the sales report generated by the design, advancing to the wiring report, or running the hardware installation wizard. Click on the button of your choice.

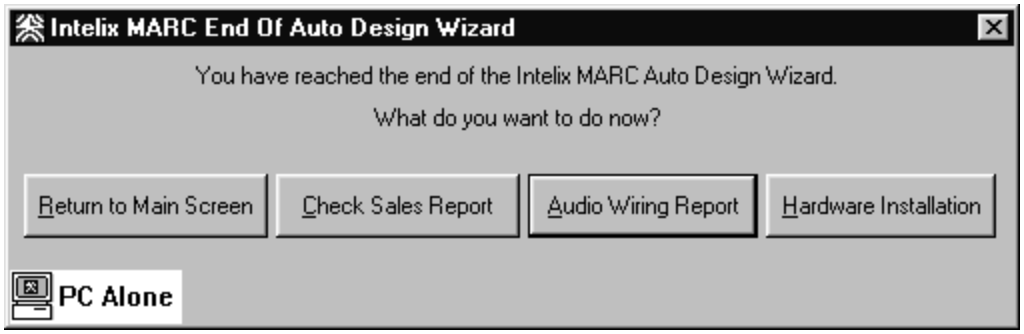

Intelix MARC End Of Auto Design Wizard
You have reached the end of the Intelix MARC Auto Design Wizard.
What do you want to do now?
Return to Main Screen
Check Sales Report
Audio Wiring Report
Hardware Installation
PC Alone

Fig. 6k MARC E Auto Design Wizard Completion Window

6.11 Station Explanations

A station is a logical grouping of Comet remotes [Comet 4(s), Comet Tails, and/or Comet 8(s)] which control the routing and volume of audio inputs into output zones. There can be up to 32 remotes in a single station and up to 64 stations in a single system. There is, however, a maximum limit of 64 remotes in a system.

6.11.1 Room combine station

The room combine station has a single function. It allows and reports changes in the status of wall in a room group. To prevent tampering, the room combine station is typically located in a secure control rack. Intelix recommends the use of the Intelix Comet-8 ReO device as the interface in a room combine station, but other interface devices such as Crestron or AMX touch panels are supported.

A Comet-8 in a room combine station will have a faceplate depicting the topology (layout) of the room group being combined, as well as a lighted push button for each moveable wall. A lit button indicates a wall is in place, whereas an unlit button indicates that the wall has been removed. The MARC matrix polls the Comet-8 steadily and uses its responses to update its internal wall list. The matrix uses this list to program the ReO remotes in each room's room control stations. When walls are removed, thereby creating new rooms, the audio control remotes mirror each other so that the audio in the new room(s) can be control correctly.

Each Comet-8 handles a single room group; each room group requires its own room combine station and associated faceplate.

Comet-8s and touch panels can be combined in a single room combine station, but care must be taken to keep the two devices in synchronization.

6.11.2 Room control station

The MARC room control station is a collection of ReO remote devices which provide user control of audio sources and volume levels. Typically a room's station contains Comet-4s for source selection and Comet Tails for source volume. Each remote button has a corresponding indicator LED.

A room control station may contain up to 32 remotes, allowing selection from a large number of audio sources.

If a Room Combine system includes default routes or local sources, they too can be controlled with remotes in the room control station.

Room control stations are automatically altered when walls are moved in the room combine system. The matrix learns of these wall changes from the room combine station. It then examines the topology to determine what room control stations are involved in the change. If two rooms are combined that both had room control stations, those two stations will now both control the audio into the combined rooms. They will automatically stay in synchronization; e.g., they will mirror each other.

7.0 The Hardware Installation Wizard

The Hardware Wizard is an integral part of the MARC Windows design software. Two main groups of users exist who may want to use the Hardware Installation Wizard:

1) Users who have completed a .mrc design file using the Auto Design Wizard through the MARC software and wish to load the design into an MARC matrix mixer, program, and test it.

2) User who wish to test the integrity of an installed wiring system, but are not loading a .mrc file.

To maneuver through the Wizard, use the “Next and “Previous” buttons. At any time you can exit the Wizard with the “Exit Wizard” button. If you decide you have made a mistake, or forgot an instruction on a previous screen, you can move to that screen and back again using “next” and “previous”.

7.1 Hardware Wizard Introduction

The Hardware Wizard is an integral part of the MARC Windows design software. There are two principle uses of the wizard:

1)writing a new .mrc file to the MARC matrix mixer

2)reading an existing .mrc file from the MARC matrix mixer for examination or modification

7.1.1 Wizard outline

The Hardware Wizard will consist of six major divisions:

1) Read – Write selection
2) Audio Wiring Test
3) Audio Path Test
4) Remote Discovery Setup
5) Remote Discovery Process
6) Remote Assignment
7) DC Control

7.1.2 Accessing the install wizard

1) For users of the Auto Design Wizard, the button labelled “Hardware Installation” on the pop-up at the end of the Auto Design Wizard will start the Hardware Install Wizard.

2) For other users there is a “Hardware Installation Wizard” item under the Installation Menu of the software.

7.1.3 Maneuvering through the wizard

To make your way through the Installation Wizard use the “Forward” and “Back” buttons. At any time you can exit the Wizard with the “Cancel” button. If you decide you have made a mistake, or forgot an instruction on a previous screen, you can move to that screen and back again using “Forward” and “Back”.

7.1.4 Introductory screen

The wizard's first screen is informational only, explaining the overall intent of the wizard. When you have read and understood it, click the "Forward" button.

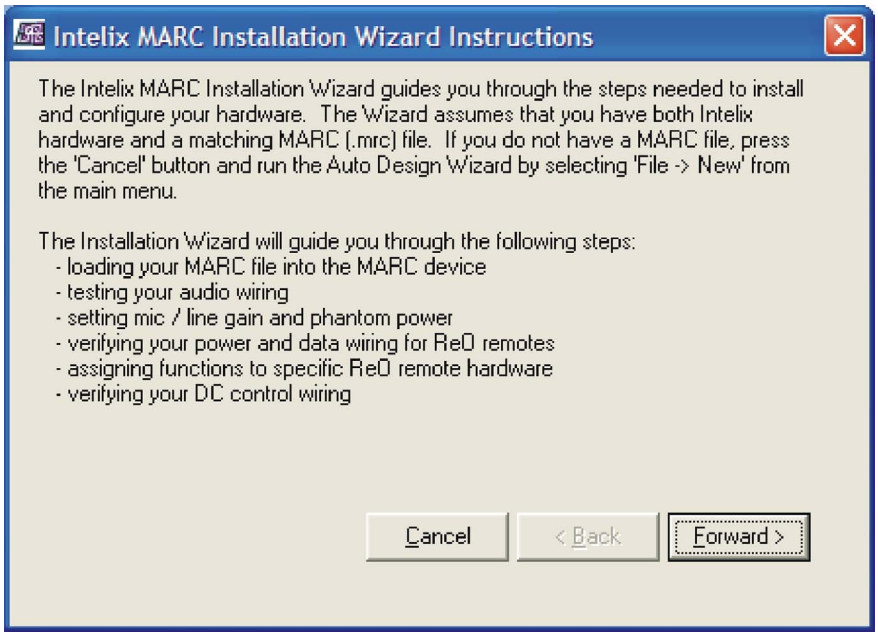

Intelix MARC Installation Wizard Instructions
The Intelix MARC Installation Wizard guides you through the steps needed to install and configure your hardware. The Wizard assumes that you have both Intelix hardware and a matching MARC (.mrc) file. If you do not have a MARC file, press the 'Cancel' button and run the Auto Design Wizard by selecting 'File -> New' from the main menu.
The Installation Wizard will guide you through the following steps:
- loading your MARC file into the MARC device
- testing your audio wiring
- setting mic / line gain and phantom power
- verifying your power and data wiring for ReO remotes
- assigning functions to specific ReO remote hardware
- verifying your DC control wiring
Cancel
< Back
Forward >

Fig. 7a MARC E Hardware Wizard Intro Window

7.2 The Hardware Wizard Start screen

The next screen of the Hardware Wizard functions as a data select screen. You must know how you will use the Wizard:

If you need to open an existing .mrc file, click the "Open a file for installation" button.

If you are writing a new .MARC file from the auto-design sequence to the MARC matrix, select the "Write data to MARC device" button.

Intelix MARC Hardware Installation Wizard
The hardware installation wizard will guide you through the steps necessary to complete installation of your MARC system. If you are loading a new or existing .mrc file, select "Write Data to MARC Device".
Write Data to MARC Device
Open a File for Installation
Cancel
< Back
Forward >
PC Alone

Fig. 7b MARC E Hardware Wizard Start Window

7.3 Audio Wiring Test

This screen requires you to view the audio sources and outputs in your design, so that you can verify that they match the physical wiring to the matrix. Fig. 7c displays the wizard Audio Wiring Test Screen.

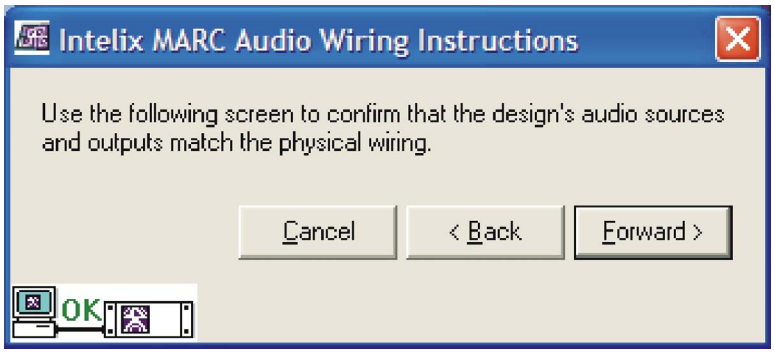

Intelix MARC Audio Wiring Instructions
Use the following screen to confirm that the design's audio sources and outputs match the physical wiring.
Cancel
< Back
Forward >
OK

Fig. 7c MARC E Audio Wiring Instructions Window

Fig. 7d displays the Audio Sources and Outputs screen. All audio sources and outputs are represented on this screen.

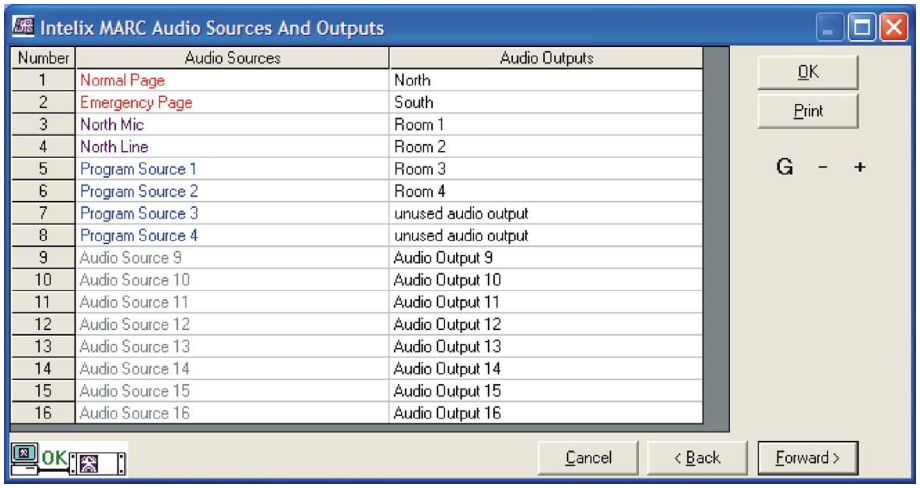

Intelix MARC Audio Sources And Outputs
Number
Audio Sources
Audio Outputs
1 Normal Page North
2 Emergency Page South
3 North Mic Room 1
4 North Line Room 2
5 Program Source 1 Room 3
6 Program Source 2 Room 4
7 Program Source 3 unused audio output
8 Program Source 4 unused audio output
9 Audio Source 9 Audio Output 9
10 Audio Source 10 Audio Output 10
11 Audio Source 11 Audio Output 11
12 Audio Source 12 Audio Output 12
13 Audio Source 13 Audio Output 13
14 Audio Source 14 Audio Output 14
15 Audio Source 15 Audio Output 15
16 Audio Source 16 Audio Output 16
OK
Print
G - +
OK
Cancel
< Back
Forward >

Fig. 7d MARC E Audio Sources and Outputs Window

7.4 Audio Path Test

The Audio Path screen lists instructions to test all audio wiring. Part of these instructions is to open the live crosspoint screen, allowing all audio wiring, sources, and outputs to be tested.

Intelix MARC Audio Path Instructions
To test audio sources and outputs follow these steps:
Turn on all audio sources and outputs. Then, on the following screen,
- Find an intersection (crosspoint) between an audio source and an audio output to be tested.
- Double-click the crosspoint to change its value to 100%.
- Listen for the audio source at the test output.
- Double-click the crosspoint and return its value to 0%.
- Repeat for all audio crosspoints to be tested.
Note: Changes made to audio crosspoints are for audio path testing only. All audio crosspoints will be returned to their previous values.
Cancel
< Back
Forward >

Fig. 7e MARC E Audio Path Instructions Window

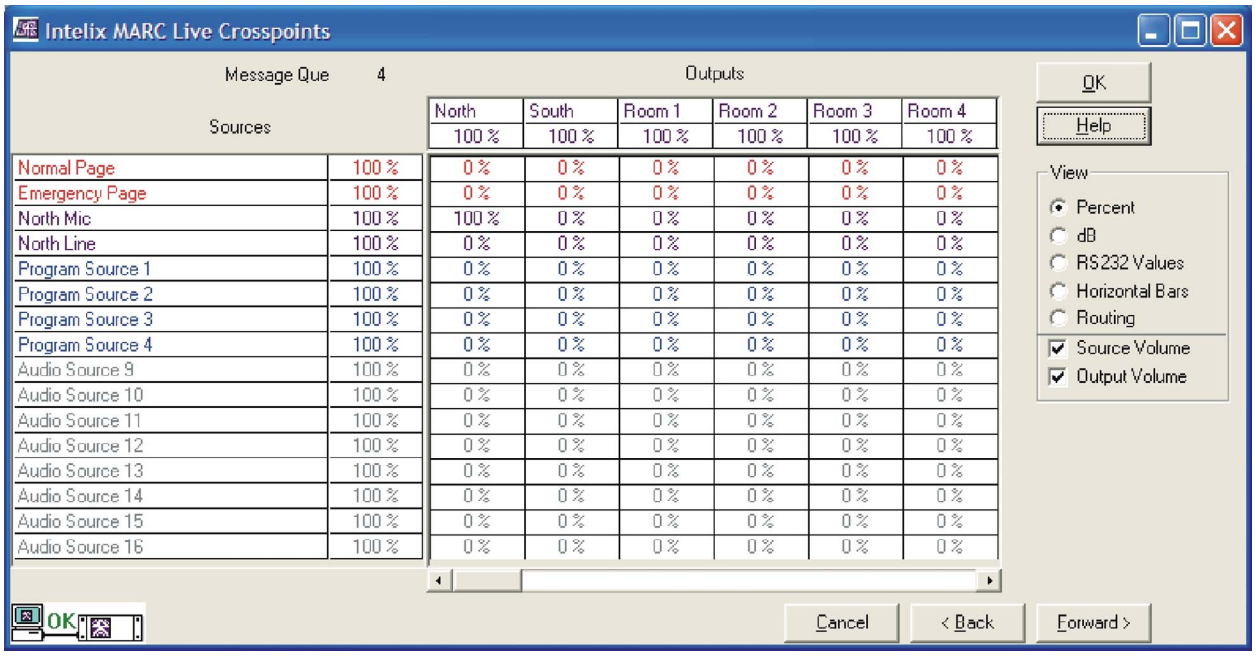


Fig. 7f MARC E Live Crosspoint Window

7.5 Remote Discovery Setup Screen

The next screens implement the process of discovering and programming the ReO remote devices in your system. Intelix recommends that you use the "Print" button to print the remote discovery list to assist you in the discovery process to come.

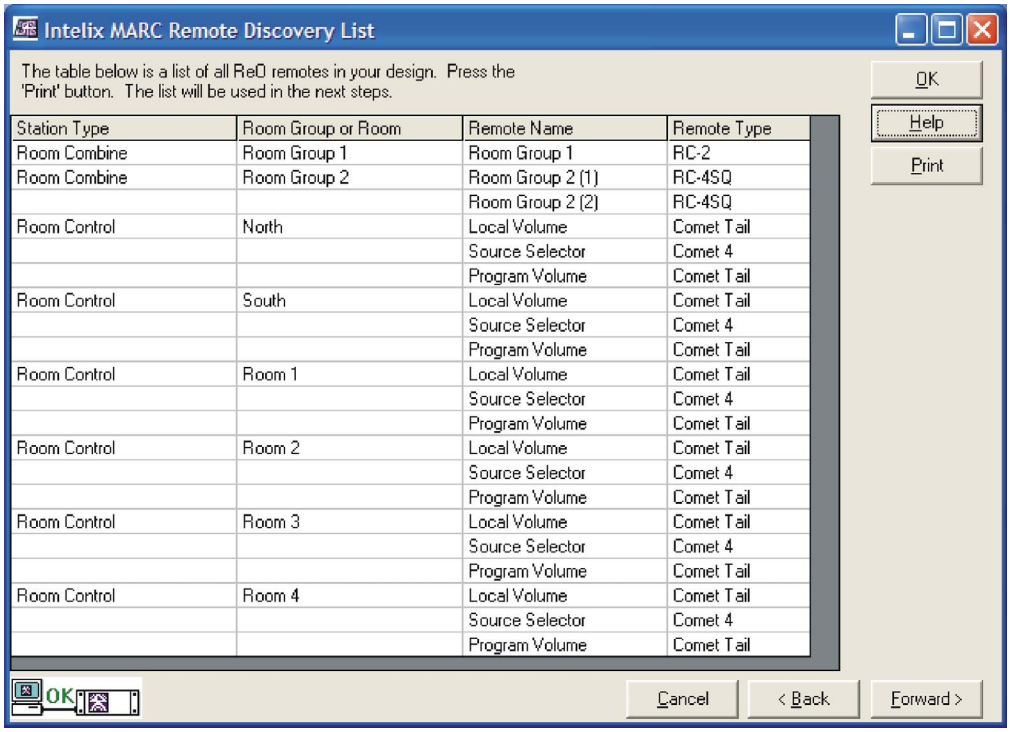

Intelix MARC Remote Discovery List
The table below is a list of all ReO remotes in your design. Press the 'Print' button. The list will be used in the next steps.
OK
Help
Print
Station Type
Room Group or Room
Remote Name
Remote Type
Cancel
< Back
Forward >

Fig. 7g MARC E Remote Discovery Window

Fig. 7h is instructional and shows the first steps in discovering system remotes. Follow all the steps to simplify the later stages of the discovery process.

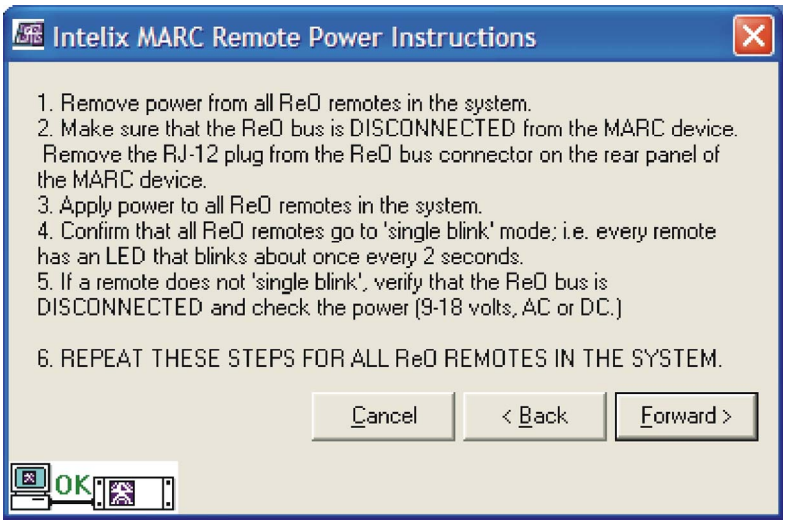
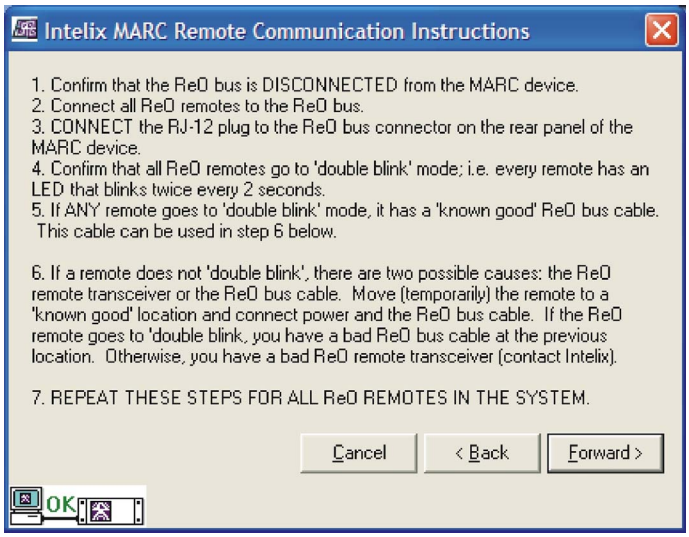

Intelix MARC Remote Power Instructions
1. Remove power from all ReO remotes in the system.
2. Make sure that the ReO bus is DISCONNECTED from the MARC device. Remove the RJ-12 plug from the ReO bus connector on the rear panel of the MARC device.
3. Apply power to all ReO remotes in the system.
4. Confirm that all ReO remotes go to 'single blink' mode; i.e. every remote has an LED that blinks about once every 2 seconds.
5. If a remote does not 'single blink', verify that the ReO bus is DISCONNECTED and check the power (9-18 volts, AC or DC.)
6. REPEAT THESE STEPS FOR ALL ReO REMOTES IN THE SYSTEM.
Cancel
< Back
Forward >
OK

Fig. 7h MARC E Remote Power Instructions Window

7.6 The Remote Discovery Process


Intelix MARC Remote Communication Instructions
1. Confirm that the ReO bus is DISCONNECTED from the MARC device.
2. Connect all ReO remotes to the ReO bus.
3. CONNECT the RJ-12 plug to the ReO bus connector on the rear panel of the MARC device.
4. Confirm that all ReO remotes go to 'double blink' mode; i.e. every remote has an LED that blinks twice every 2 seconds.
5. If ANY remote goes to 'double blink' mode, it has a 'known good' ReO bus cable. This cable can be used in step 6 below.
6. If a remote does not 'double blink', there are two possible causes: the ReO remote transceiver or the ReO bus cable. Move (temporarily) the remote to a 'known good' location and connect power and the ReO bus cable. If the ReO remote goes to 'double blink, you have a bad ReO bus cable at the previous location. Otherwise, you have a bad ReO remote transceiver (contact Intelix).
7. REPEAT THESE STEPS FOR ALL ReO REMOTES IN THE SYSTEM.
Cancel
< Back
Forward >
OK

This screen gives further directions allowing you to establish communication between the matrix and the remotes.

Fig. 7i MARC E Remote Communication Instructions Window

7.7 Unassigned Remote Screen

This screen shows all physical remotes that have been discovered by the system. The screen in Fig. 7i shows the Comet-8 and one Comet Tail. If other remotes are present, they may be viewed either by scrolling to the right or clicking the "icon" view button. In following steps, the physical remotes will be assigned to your programmed virtual remotes.

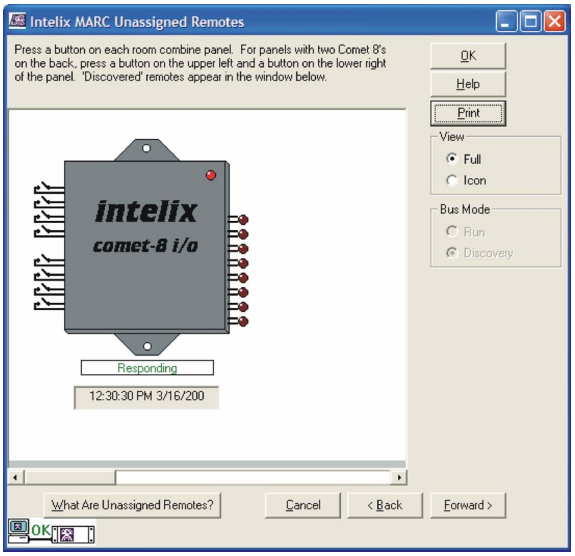


Fig. 7j MARC E Unassigned Remotes Window

7.8 Room Combine Station

This screen demonstrates the assignment of a Comet-8 remote to the room combine panel. The Comet-8 (visible at the right of the screen) is dragged and dropped onto the button on the panel. This causes the Comet-8 to be automatically configured for the panel onto which it was dropped.

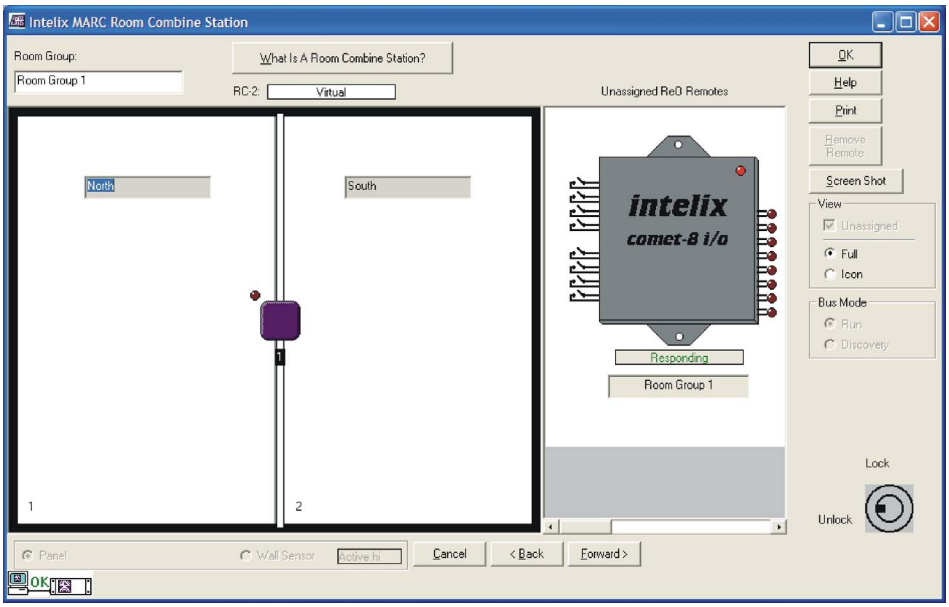
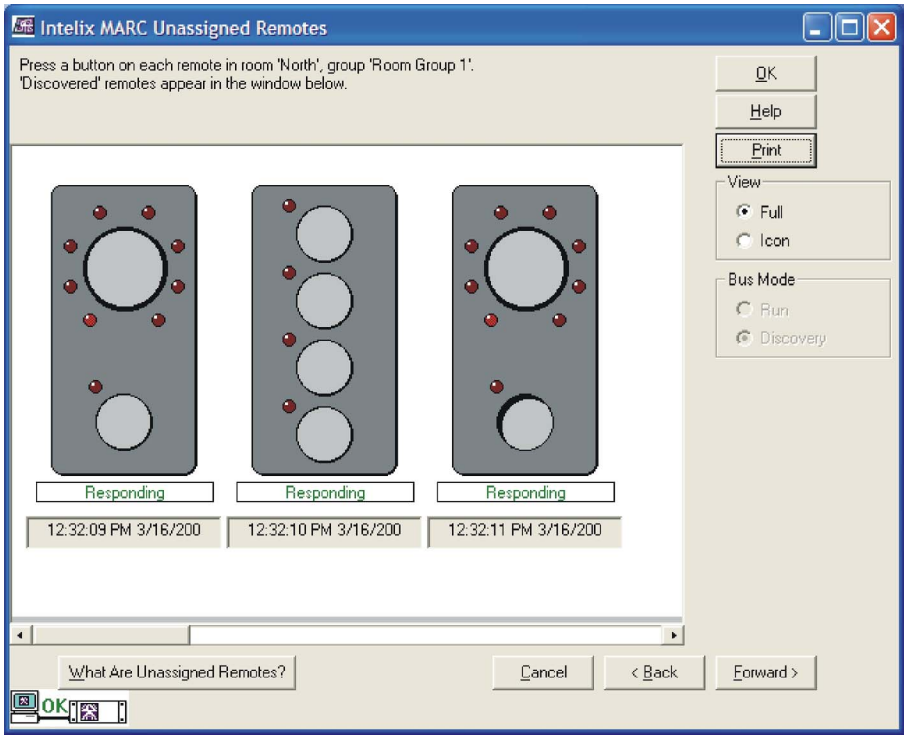


Fig. 7k MARC E Room Combine Station Window

7.9 Unassigned Remote Screen



This is an updated version of the screen shown in section 7.7. The Comet-8 is now gone from this screen since it was assigned in section 7.8. Remaining unassigned remotes are Comet Tails and Comet 4s which will be assigned to room control stations in following steps.

Fig. 7l MARC E Unnassigned Remotes Window

7.10 Room Control Stations

This screen depicts a room control station consisting of a single Comet Tail and Comet-4. The two physical remotes in the right pane will be dragged and dropped onto the two virtual remotes in the left pane. The cursor indicates drag and drop status--where you can and can't place the remote. When you drop a remote in an appropriate spot, a window will appear allowing you the choice of how to name the remote.

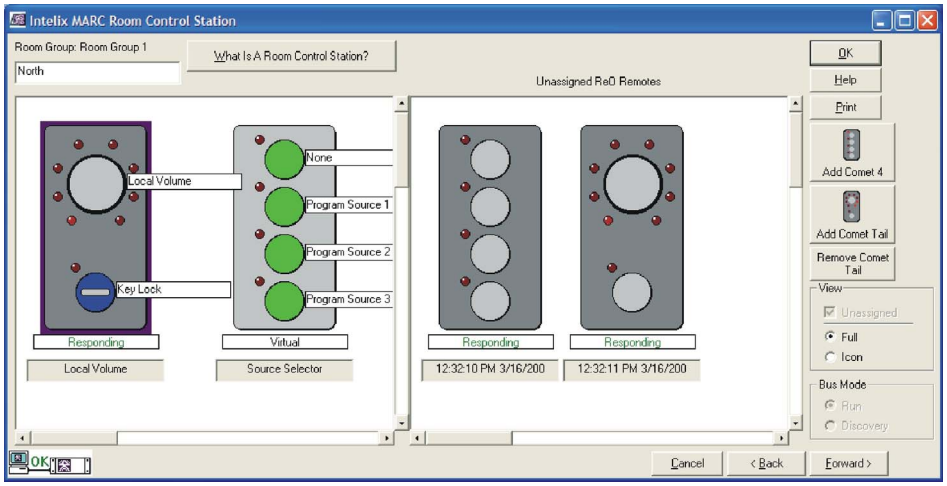


Fig. 7m MARC E Room Control Stations Window

As you proceed through the wizard, you will see this screen repeated for each room control station in the design. For each room, drag and drop the physical remotes onto the virtual remotes to program them with your design.

7.11 The Remote Naming Window

This window appears each time you drop a physical remote onto a virtual one. Your choices for naming the remote are:

1) Retain the name assigned to the virtual remote
2) Retain the name assigned to the physical remote
3) Give the remote a new name (type the new name in the text box and click *OK*)

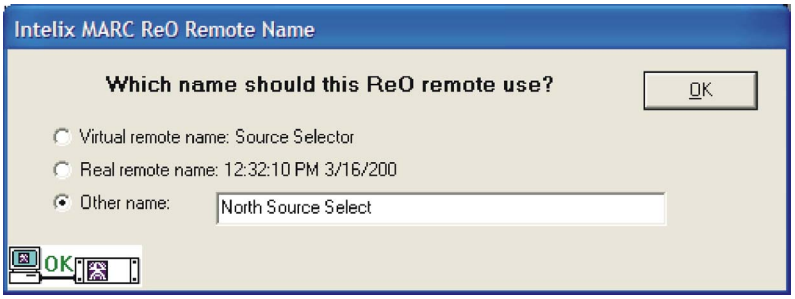
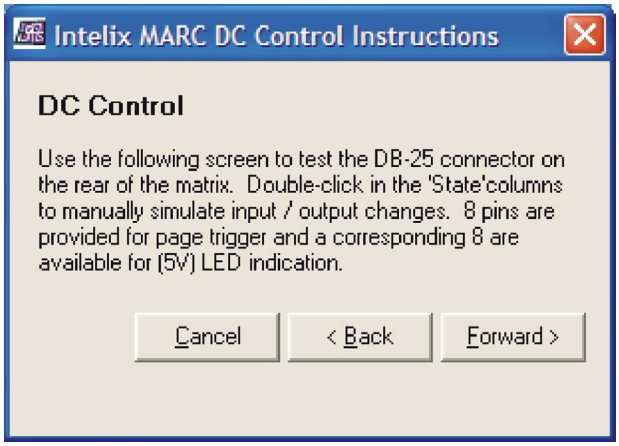


Fig. 7n MARC E Remote Naming Window

7.12 DC Control


Intelix MARC DC Control Instructions
DC Control
Use the following screen to test the DB-25 connector on the rear of the matrix. Double-click in the 'State'columns to manually simulate input / output changes. 8 pins are provided for page trigger and a corresponding 8 are available for (5V) LED indication.
Cancel
< Back
Forward >

The next screen is instructional, explaining the configuration of DC control functions. After you have read and understand it, click on the "Forward" button. You will see the DC control screen shown in Fig. 7p. DC control is the final step in the Hardware Installation Wizard.

Fig. 7o MARC E DC Control Instructions Window

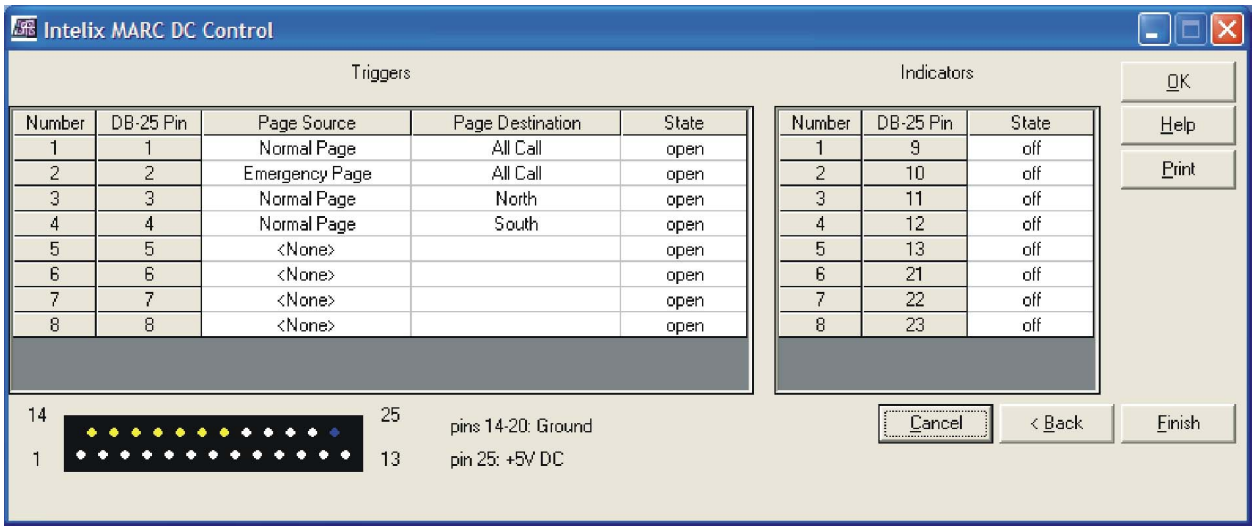


Fig. 7p MARC E DC Control Window

7.12.1 Page trigger state column

If your PC is connected to a MARC matrix mixer, you can simulate a trigger closure by double-clicking on the trigger's state column. This acts exactly as if you had pressed a contact closure on that trigger pin. If you are using an external device to trigger pages via the DB25 connector, you can test all paging functions before your triggering device is connected. Simply double-click the state column and verify that the corresponding page is triggered.

7.12.2 Indicator state column

If your PC is connected to a MARC matrix mixer, you can activate an output indictor by double-clicking on that indicator's state column. If your design has external equipment with indicators; i.e., a touch panel to trigger pages that has page indicator LEDs, you can test the LED connections by double-clicking the Indicator state column and verify the corresponsing LED toggles.

8.0 Activating ReO Bus Remotes

This section covers how to activate ReO bus remotes in the Intelix MARC system.

8.0.1 Bus modes overview

There are three modes in which the MARC system can operate: Run mode, Halt mode, and Discovery mode.

8.0.2 Changing bus modes

To change between Run, Discovery, and Halt modes, open the Unassigned Remotes screen in the main window of the software.

8.0.3 Run mode

Run mode allows the system to function normally; i.e., it polls each remote in the system on a round-robin basis and processes the remote commands. *This is the mode in which the system must be left after programming.*

Run mode also allows system alteration to a limited degree. If a single remote control is added to the system while it is in Run mode, that remote will be recognized and correctly added to the system. If multiple remotes are to be added at one time, the system should be put in Discovery mode.

8.0.4 Discovery mode

Discovery mode allows the addition of multiple ReO remotes at a time, as when a new system is first programmed. Each remote added must be exercised in a known sequence to allow correct discovery by the MARC matrix.

Discovery mode is normally used only during initial setup and programming of a system.

In the discovery process, the MARC will be told to discover and report all ReO remote devices connected to it. *Remotes are discovered in the order they are exercised* (a knob turn or button press), so it is critical to have an ordered list in which you will exercise them. As each remote is discovered, it is displayed on the Unassigned Remotes screen, and can then be assigned to the stations in your design by clicking and dragging on screen. After discovery and assignment are complete, you will put the MARC in Run mode to test operation of the system.

To use Discovery mode, complete the following steps:

1) In the MARC software, open the Unassigned Remotes screen.
2) Click on the *ReO Mode Discovery* button.
3) Obtain the ordered remote list from the menu.
4) Using the list, go to each physical remote and take these steps:
    a) Verify the remote's LED is in double blink mode.
    b) Locate the remote on your ordered list of remotes. The list should contain a virtual remote with a name that corresponds to the physical remote's location. Mark this remote in the visitation order column so that you can determine the order youexercise the remotes.

c) Exercise the remote (press a button or turn a knob).
d) Verify the remote's LED goes to steady off, indicating that the remote has been recognized.

5) Repeat steps 4a-4d for all remotes. After all remotes have been exercised and have appeared as "responding" on the Unassigned Remotes screen return to the PC.
6) Name each remote on the Unassigned Remotes screen with an indicator of its physical location; e.g., "west side of Room A".

8.0.5 Halt mode

Essentially, Halt mode stops traffic on the ReO bus, "halting" remote communication. Specifically, Halt mode allows you to perform a "write" to the MARC without disconnecting the ReO bus. The Halt mode process is performed automatically during a write in MARC Designer Software version 3.3.55 or later.

During Halt mode, any actions on the ReO bus (i.e., volume toggling, source selection, etc.) will be stored in a queue and rapidly exercised when the bus mode is returned to "run" or the write process is completed.

8.1 Remote Assignment

The process of programming the physical remotes consists of dragging the image of the physical remote from the Unassigned remote screen and dropping it on the corresponding virtual remote in the station screen.

If the names of the physical and virtual remotes are a good match; i.e., are easy to match with one another, this process can go very quickly. If the names do not correspond well, you may need to do some searching to determine which ones correspond. The Intelix software provides a number of diagnostic tools to simplify this process.

Note: Why Naming and Discovery Sequence are Critical
Remotes are discovered by the MARC in the order they are exercised. When remotes are first discovered by an MARC matrix, the remotes are undifferentiated; the matrix cannot tell the difference between one Comet-4 and another. In order for the installer to assign physical remotes to correct virtual remotes in the design program on the PC, there must be a way to differentiate the remotes.

As you visits rooms and stations, the remotes you exercises are recognized and appear on the PC screen in the order visited. They will appear in the Unassigned Remotes window in order of discovery, left to right and top to bottom.

When you return to the PC to assign virtual remotes to the newly recognized physical remotes, you must be able to distinguish among the remotes on the screen.

There are two things you should do to make this process simple. First, carry the Remote Installer's list (generated from Reports -> Stations -> List -> Print). Everytime you exercise a remote, mark its physical location and its sequence number; for the first remote visited, mark it as sequence #1 and an

appropriate name; e.g., “west side of ballroom”. Next, verify you have given good descriptive names to both the physical remote (i.e., “west side of ballroom”) and to the virtual remotes in the design program on the PC. Ideally, the virtual names should be the same as the physical ones. Names of virtual remotes can be changed at any time. Ensure you have descriptive, useful names for all remotes.

8.1.1 Non-responding remotes

If any remotes in the Unassigned Remotes window have a status indicator reading “Not responding”, they have lost communication since you exercised them and should be repaired before proceeding. There are two main causes for the problem: power and ReO bus. Pull and replug the power plug. The remote’s LED should go to single blink, then double blink. This indicates that communication has been restored. If the remote still does not respond, there is a problem in the ReO bus; either an intermittent problem in the ReO connector at that remote, or noise and reflections on the bus.

8.1.2 Searching for a lost remote

If you have a physical remote in the unassigned remotes screen that you cannot match with a virtual remote on the PC screen, double click on an LED of the mystery remote in the Unassigned Remote screen. This will cause that LED to blink at about .5 Hz both on the PC screen and on the physical remote. Now leave the PC and search for a remote with its LED blinking at that rate. When it is found, note its location, return to the PC, and rename it in the Unassigned Remote screen with a name which makes its location obvious. You can now assign it to its corresponding virtual remote.

8.1.3 Retracting a mistaken drag and drop

If you accidentally drag and drop a physical remote to a virtual one, and realize that you have dropped it on the wrong remote, you can undo the error simply by dragging and dropping the remote back to the Unassigned Remote screen. It is now unprogrammed again and ready to be dropped onto the correct virtual remote.

8.1.4 Testing remotes with a two person team

If two people are available for system testing, it is efficient to do as follows: on the PC bring up the station being tested (Paging Station or Program Station screen). Send the second person to the physical remote and have them press the buttons and turn the knob (if any). The actions at the physical remote will appear on the PC screen, verifying that the remote is working correctly.

8.2 Hardware Test Mode

Hardware Test Mode allows buttons in Intelix MARC Designer Software to be automatically linked to their LEDs on the physical comet device using the Unassigned Screen in Run Mode. Once in Hardware Test Mode, pressing a button in Run Mode will cause the LED to light on the associated device. This is a looped process and is used for diagnostics only--the process is not connected to any logic.

8.2.1 Remote blink codes

The LEDs on remotes have five main blink codes to assist determining the state of a remote (these codes appear only on the physical remotes, not on the PC screen):

a) **All LEDs off**: either not powered or normal run state; if new system check power supply to remote.

b) **Single blink**: powered but no communication. ReO data bus problem or not yet exercised. If new system, there is a problem in the ReO bus to that remote.

c) **Double blink**: powered up and received a message from the matrix.

d) **Triple blink**: This state means a message has been lost between the matrix and the remote. ReO bus problem. Check for noise or reflection conditions on the bus.

e) **Steady on**: custom programmed state, unknown meaning.

Remember:For correct operation of the system, you must go to Run mode after all modifications are complete.

9.0 MARC Windows Reference

This section is organized by menu items. For each item on the main MARC menu there is a section detailing the uses of the selections under that item. The main menu is at the top of the MARC main screen as shown in Fig. 9a. The major items are:

1) File
2) Configuration
3) Reports
4) Installation
4) Diagnostics
5) Options
6) Help

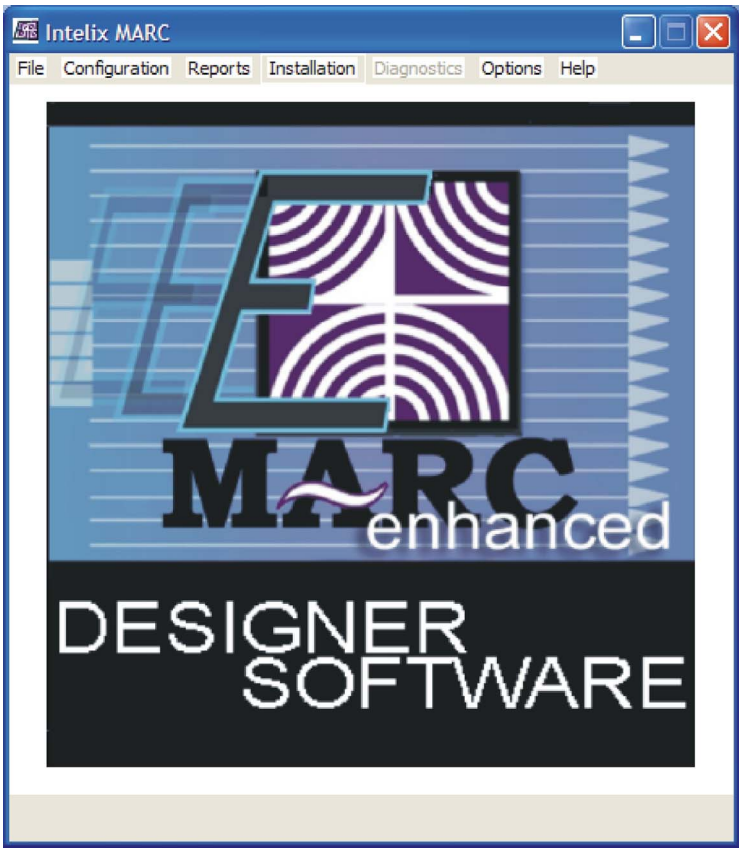


Fig. 9a MARC E Main Window

9.1 The File Menu

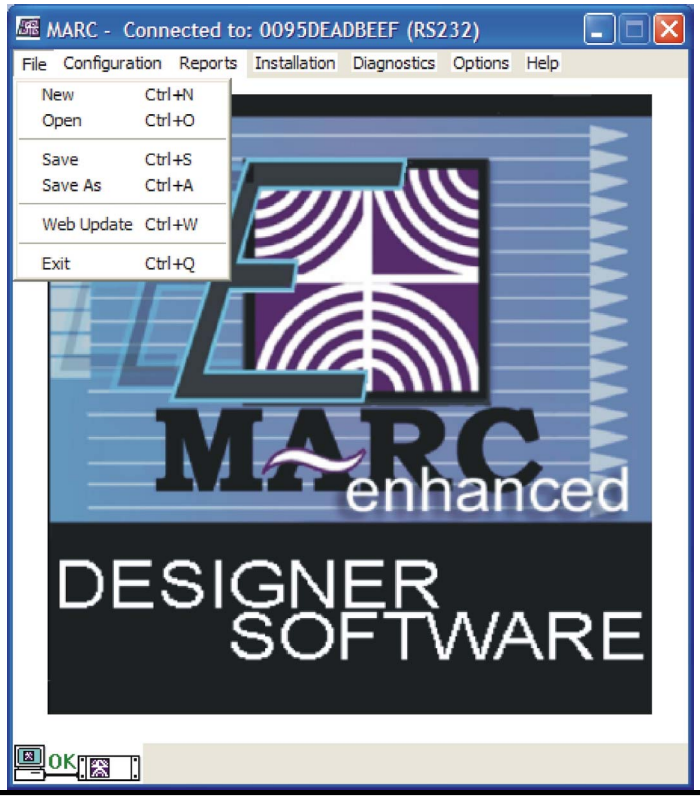


Fig. 9b MARC E File Menu Dropdown

9.1.1 The New Item

Selecting the New Item from the File Menu causes a prompt for the path and name of the new file to be created. After you have specified a name and path, the software starts the auto-design process, which is a series of screens presented in sequence to guide you through the designing a system. You are informed that auto-design is about to begin. If you click OK, the auto-design process begins. During auto-design the new file is automatically saved after every window in the sequence. If you click *Cancel* you are returned to the MARC main screen.

9.1.2 The Open Item

Selecting the Open Item from the File Menu causes the software to prompt you for the path and name of the file you wish to open. After you have specified the path and filename, the software opens that file, showing progress as it does so. On a fast machine or a small file, this progress indicator may be barely visible.

9.1.3 The Save Item

Choosing the Save Item from the File Menu causes the software to save the currently open file to disk. All changes since the last save are updated.

9.1.4 The Save As Item

Selecting Save As from the File Menu allows the user to create new file based on existing ones. If a new program requires only a single change to an existing file, open that file with the Open Item, make the change and select the Save As Item. You will be prompted for a path and filename. The new file will then be saved under the new name and the original file unchanged under the old filename.

Note: During auto-design (triggered by the New Item) the file being created is automatically saved after every screen. ***This is only true during auto-design.***

Read, write, and live changes do not affect the disk file until a "save" is performed. However, any changes made in the screen when connected to a matrix will change the program file in the matrix.

9.1.5 The Web Update Item

Selecting the Web Update Item instructs you how to go to the Intelix web site, where the newest versions of Intelix software can be downloaded. Read the instructions on the screen to reach the download site.

9.1.6 The Exit Item

Selecting the Exit Item from the File Menu closes the MARC software and returns you to the desktop. If you have made changes to a file, the program will ask you if you wish to save the changes.

9.2 The Configuration Menu

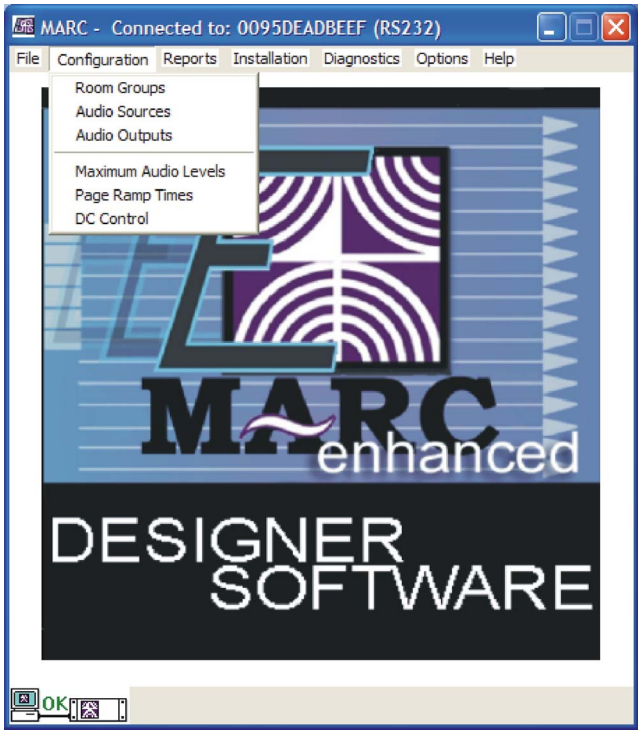


Fig. 9c MARC E Configuration Menu Dropdown

9.2.1 Room groups

Fig. 9d shows the room groups screen, with default names, and topologies.

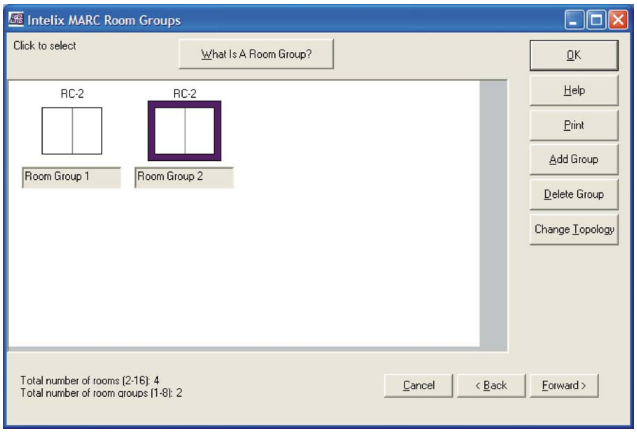
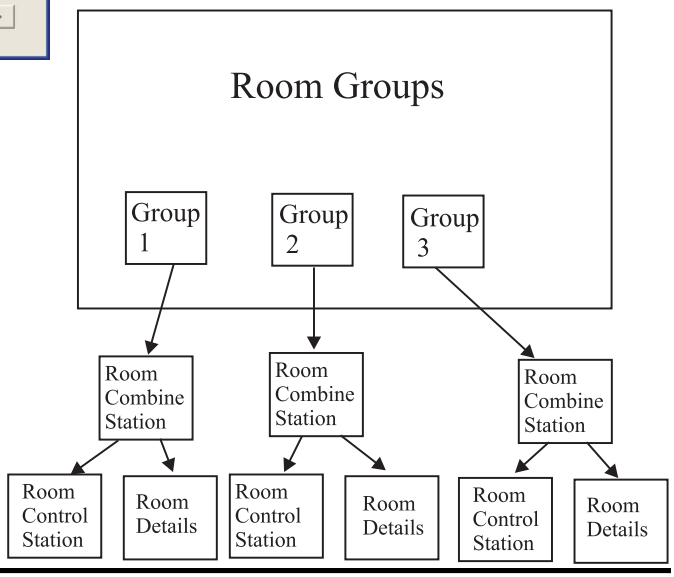


Fig. 9d MARC E Room Groups Window

Fig. 9e demonstrates how the design screens are accessed from the room groups screen. Note that each room group has its own room combine station and that each room combine station leads to an individual control station and details for each room in the group.

Fig. 9e Room Group Chart



9.2.1.1 Naming room groups

In the text box below each room group icon, you can enter the desired name for that group.

The names shown are the default names “Room Group 1” and “Room Group 2.”

9.2.1.2 Adding/deleting room groups

To add a room group, click on the “Add Group” button; a default two room group will appear. To delete a room group, select the group to be deleted (it highlights) and click the “Delete Group” button.

9.2.1.3 Changing topology

To change the topology for a group, click on the group (it highlights) then click the “Change Topology” button. You will see the screen shown in Fig. 9f. Select the topology you want and click *OK*. You will be returned to the room group screen and the selected topology will be visible. Repeat for each room group to be changed. If your combination of room groups and topologies exceed 16 rooms you will be warned to reduce your design.

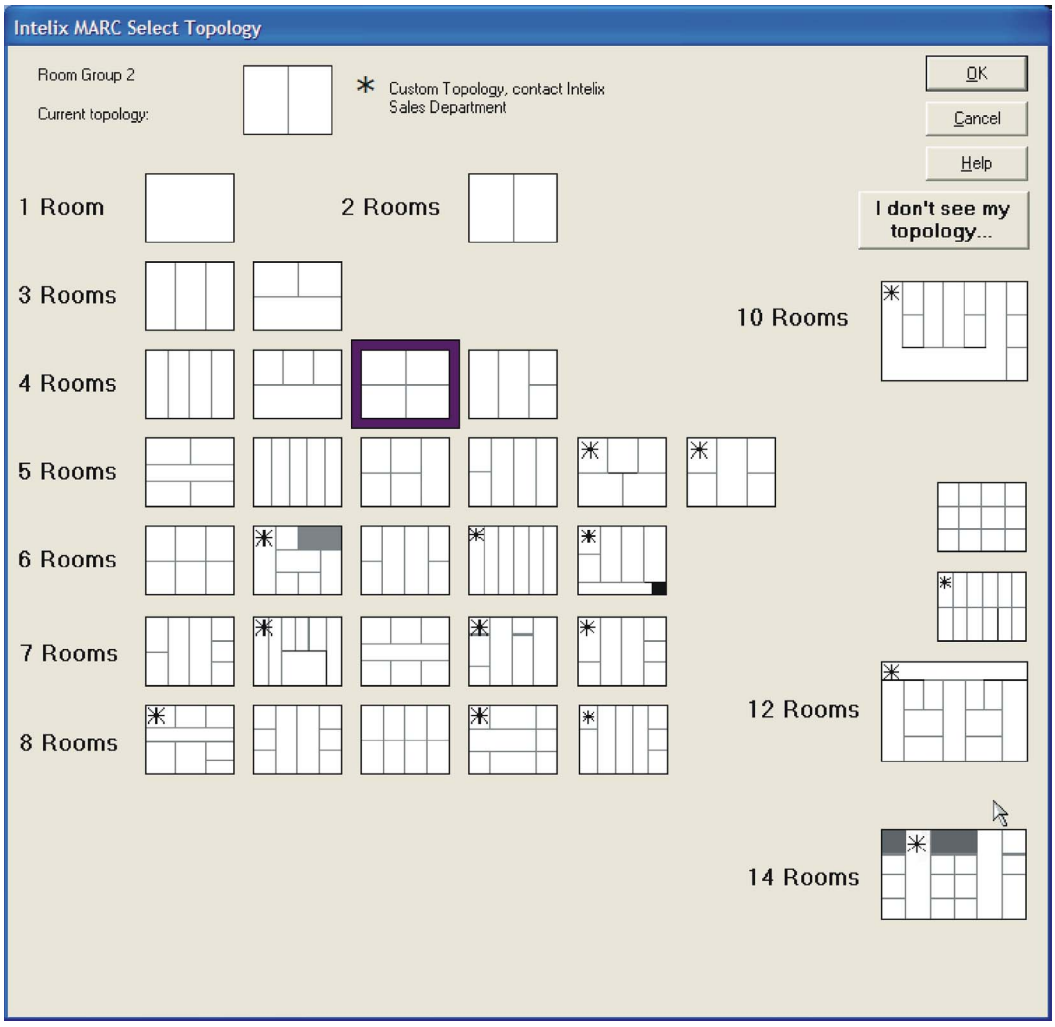


Fig. 9f MARC E Topology Window

9.2.1.4 The room combine screen

Each room group will have an associated room combine station. To reach the room combine station screen for a room group, double-click the room group. The room combine station for that group appears. Clicking on the wall switches will toggle their state, as the switches are live; i.e., you will see the switch's LED go on/off, and the matrix will be notified that the wall has been opened/closed. This has exactly the same effect as actually pressing the button on the room combine panel.

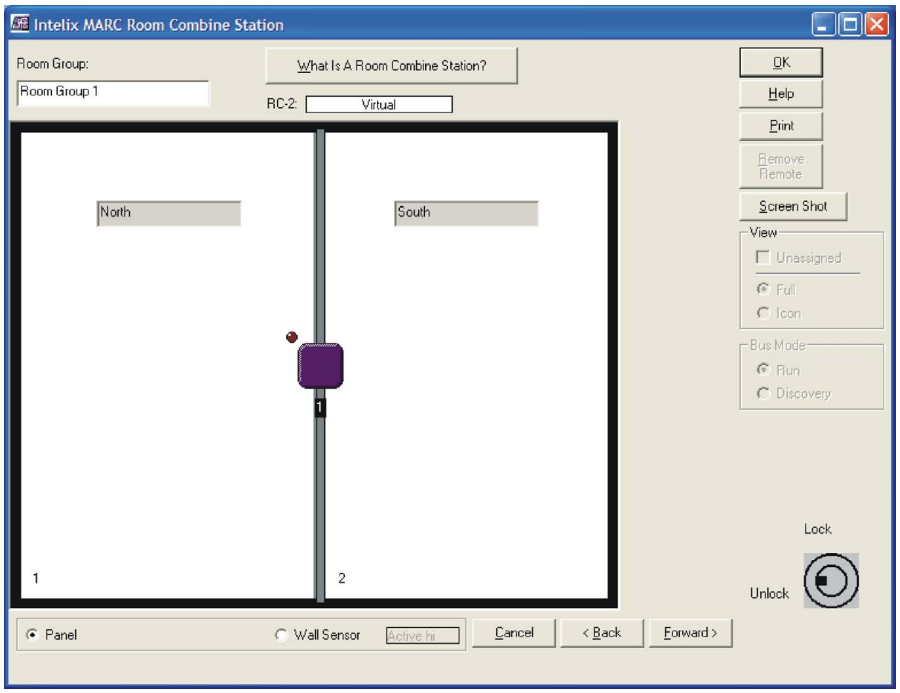


Fig. 9g MARC E Room Combine Window

9.2.1.4.1 Wall/panel selector

At the bottom of the room combine station screen are two selection buttons: panel and sensors. If your design uses a room combine panel, make sure the "panel" check box is selected. If instead you are using wall sensors to directly sense the open/closed state of walls, toggle that selection. If panel is selected you may then choose the "mirror" option which creates a parallel panel for control from dual locations. This second panel may be chosen to have Comet-8(s) only to provide external triggers to Crestron or AMX style controllers. If "Wall sensor" is selected, you may select the polarity of the sensor by double-clicking on the "polarity control.

If your system is "out of sync" because you designed with this check box incorrectly set. First read the MARC system, and save it as a file. Next, open that file and select the correct check box for panel/wall sensor. Cycle the power on the remote panel. Finally, reload the modified file back to the MARC system. The system should now be in sync again.

9.2.1.4.2 Room numbers and wall numbers

In the MARC software, each room and each wall in a room group is assigned a number. To use certain control messages you will need to know the room/wall number. These numbers are displayed on the room combine screen. The room number appears in the lower left corner of each room. The wall number appears as a white on black number on each wall.

9.2.1.4.3 The room control screen

Each room in a group will have an associated room control station. This station contains the remotes used to control audio in the room.

To reach the room control station screen for a room from the room combine screen, click the icon in the room combine screen. The room control station for that group appears. A typical default room control station is depicted in Fig. 9h.

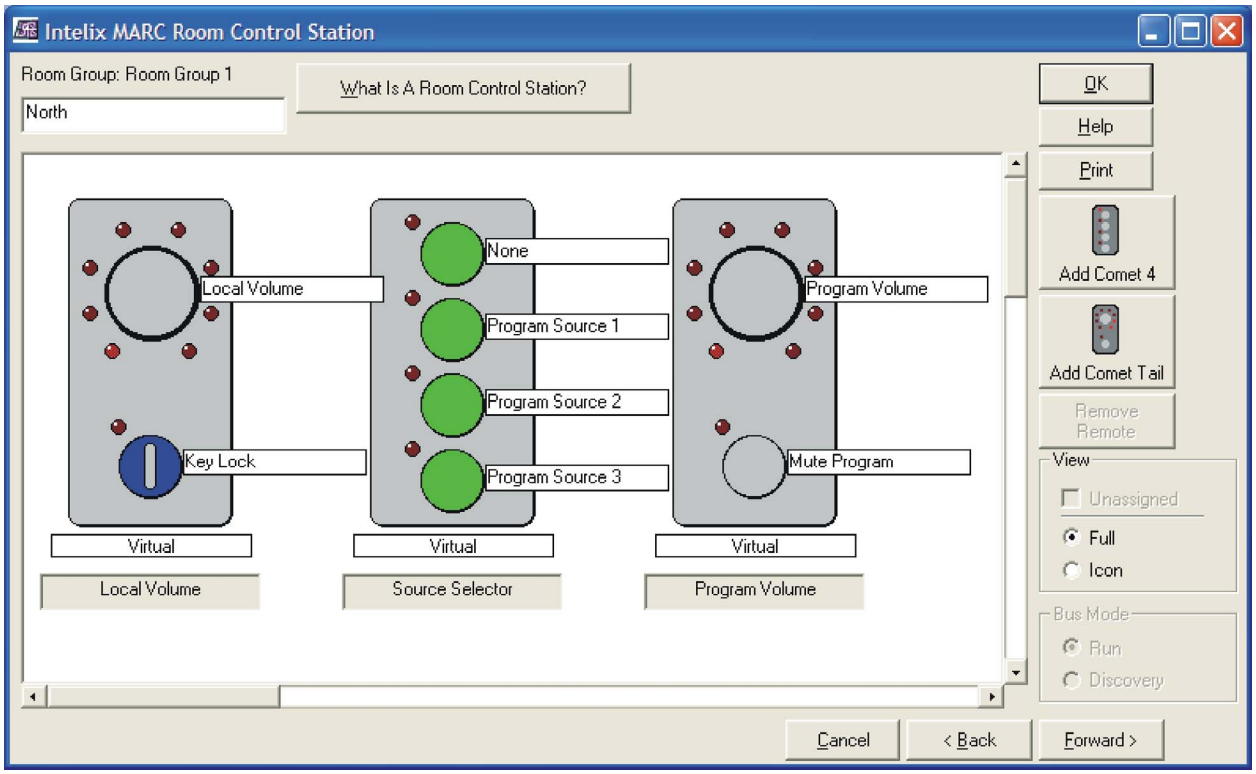


Fig. 9h MARC E Room Control Window

9.2.1.4.3.1 Adding/deleting remotes

To add a remote to a room control station, click either the “Add Comet 4” or the “Add Comet Tail” button. The remote will be added to the station. To delete a remote, select the remote to be deleted (it highlights), then click the “Remove Remote” button. The remote disappears.

9.2.1.4.3.2 Naming remotes

To name a remote, click on the box labelled “Click Here to Change Name” and type the new name.

9.2.1.4.3.3 View options

There are two methods for viewing the remotes in the room control station: full and icon. They vary only in the displayed size of the remotes. Normally you should use full view, but when working with a station containing a large number of remotes, it may be more convenient to use icon view.

The “Unassigned” selection in the view panel causes the window to split into two panes. The left pane shows the virtual remotes in the station. The right pane shows all unassigned remotes that have been discovered in the system. You can program the virtual remotes by dragging and dropping the unassigned remote from the right pane to the virtual, programmed remote in the left pane. After you drop an unassigned remote on a virtual remote, the unassigned remote is immediately programmed with the characteristics of the virtual remote. If you have made a drag and drop error and wish to undo the operation, simply drag the remote back from the left pane to the right pane, and the remote’s programming is undone.

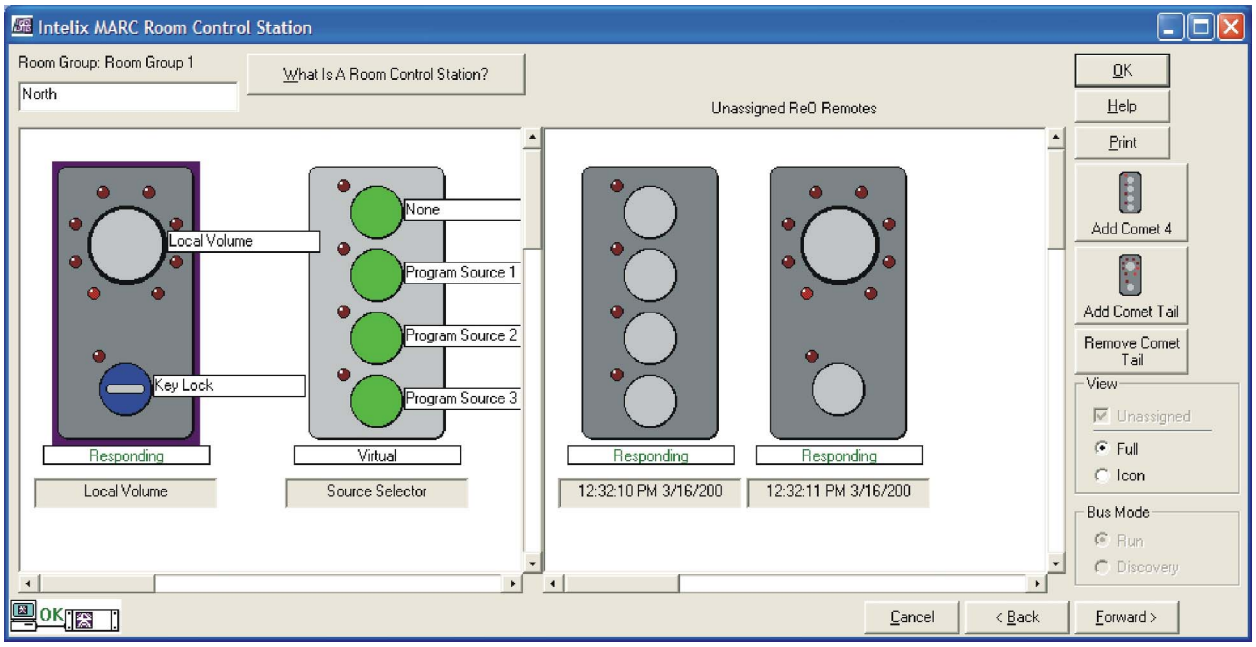


Fig. 9i MARC E Room Combine Window with Unassigned Remotes

Fig. 9i shows the room control station with the “unassigned” view selection active. Note that each pane of the window has its own scroll bars, and that full or icon views can be chosen. Programming is done by clicking and dragging a physical remote from the right pane and dropping it on the correct virtual remote in the left pane.

9.2.1.4.4 Room details

On the room combine station screen there is a “details” button for each room. This button displays the screen shown in Fig. 9j.

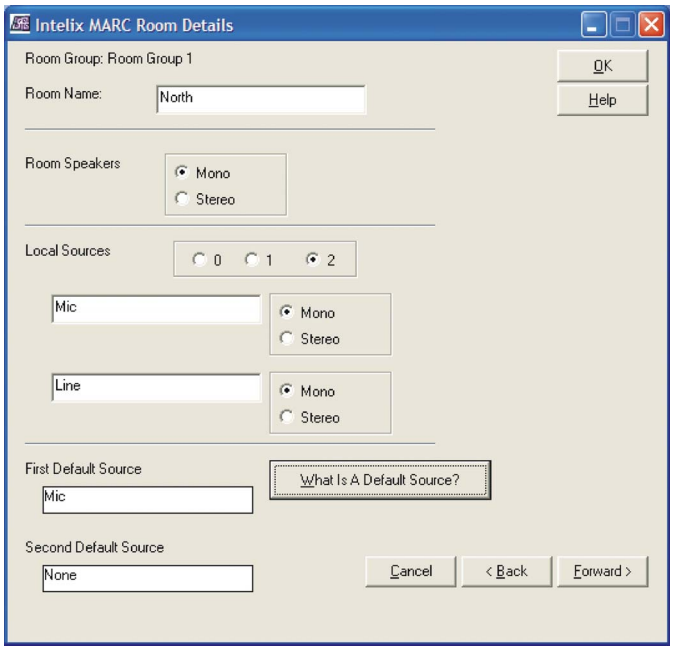


Fig. 9j MARC E Room Details Window

9.2.1.4.4.1 Room name

The room can have its room name set or changed on this screen. If you have a custom room combine station panel, the room names on this screen should match those on the panel.

9.2.1.4.4.2 Mono/stereo

This item defines whether the audio going to this room is mono or stereo. Click the desired radio button for each room.

9.2.1.4.4.3 Local sources

A local source is an audio source that originates from this room. A local source is not made available to other rooms in the group. Typical local sources are microphones in the room or a background music source that is not used in any other room. A room can have from zero to two local sources. Click the button corresponding to the number of local sources this room will have. Local sources can be mono/stereo and should be named in this screen. All rooms are defaulted to having one local source; to remove it click the zero button selection.

9.2.1.4.4.4 Default sources

A default source is an audio source that is turned on to a given room whenever a wall is moved. This provides audio to rooms, including rooms that do not contain a Comet-4 for selecting audio sources or Comet Tails for adjusting audio volume. The level of the default source is determined by the setting of the lowest Comet Tail among each of the rooms that this room is combined with. Each room can have up to two default sources; however, if a room has two default sources, the two sources will be mixed. Select a source from the pick list provided. The list contains all program and local sources, any of which can be a default source for this room.

9.2.2 Audio sources

The audio sources screen allows you to name and define all audio sources in the system. The Audio Source screen is shown in Fig. 9k. All rooms are assigned one default source.

Fig. 9k MARC E Audio Sources Window

9.2.2.1 Naming audio sources

All audio sources can be named on this screen. Rather than accept the default names, we recommend that you add descriptive names in your design. To change the name click on the name, type the new name, and press “Enter”.

9.2.2.2 Audio type

Each audio source has an audio type each with their own color code. There are three audio types: page (red), local (purple), and program (blue). Each source has its type listed in the “type” column. Audio types cannot be altered.

9.2.2.3 Mono/stereo selection

An audio source can be either mono or stereo. Click on the Mono/Stereo column and select the desired setting. A stereo source has its left/right and stereo partners automatically assigned and cannot be altered.

9.2.2.4 Volume column

This column sets the maximum possible level of an audio input. This value controls the virtual VCA on the input, meaning that this setting effects the entire input row. A typical use for this control is to lower the level of a particularly hot input across the whole matrix.

9.2.2.5 Pan column

This column sets the maximum possible level of an audio input. This value controls the virtual VCA on the input, meaning that this setting effects the entire input row. A typical use for this control is to lower the level of a particularly hot input across the whole matrix.

9.2.2.6 Add/remove program

All available program sources are listed on the Audio Sources screen. Some may be listed as unused, meaning that audio inputs are available to be used. To add a new program source, click the "Add Program" button. A new program source will appear on the list. Enter a new name for the new source. If you add a program source that cannot be accommodated by the existing matrix; e.g., adding program source 9 to an 8 x 8 matrix, the software will increase the size of the matrix by adding eight new inputs.

9.2.2.7 Adding/deleting mic/line cards

A mic/line card is an optional eight channel preamplifier card which can be added to your design if low level signals are used as sources. To add a mic/line card, click on the "gain" column of the input needing the card, then click the "Add Mic/Line" button. To remove a mic/line card, click on the gain column for the input whose card is to be removed, then click the "Delete Mic/Line" button.

Note that mic/line cards must be added from the top down and removed from the bottom up (in groups of eight). If the "Remove Mic/Line" will not become active it is because of this restriction.

9.2.2.8 Normal/emergency page

These check boxes allow you to include two kinds of paging in the MARC system. They differ in priority only. The normal page ducks non-page audio sources during a page, while the emergency page mutes all audio sources (including normal pages). The MARC comes defaulted to both page types. To change the default click on the desired check boxes. The paging sources will automatically be assigned to the appropriate DB25 pins. These pin assignments cannot be changed.

9.2.2.9 The pan column

Each audio input has a pan control. Click on the pan column for that input and the pan control screen appears. Click and move the slider to the desired level, the range is 1-255. This value determines the way the input is sent to the outputs. For a mono input the control is a simple pan value with presets at left, center and right as 9l. For a stereo input the control is width which determines how the sides of the input pair are distributed to the left and right side of a stereo output. The width control has presets at stereo, center and reverse stereo, as shown in Fig. 9m.

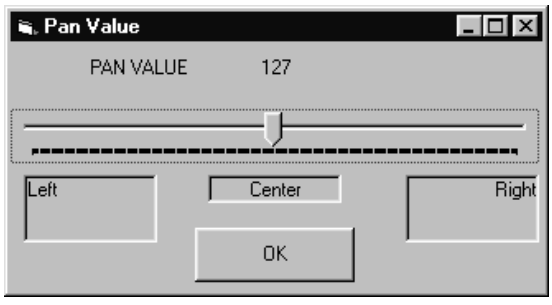


Fig. 9l MARC E Pan Value Center

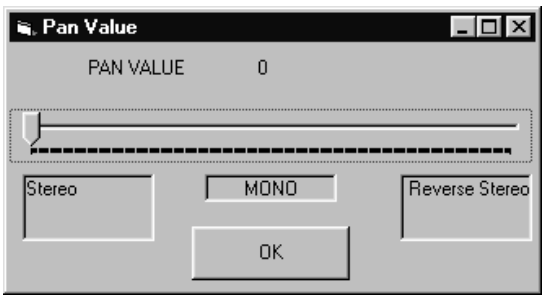
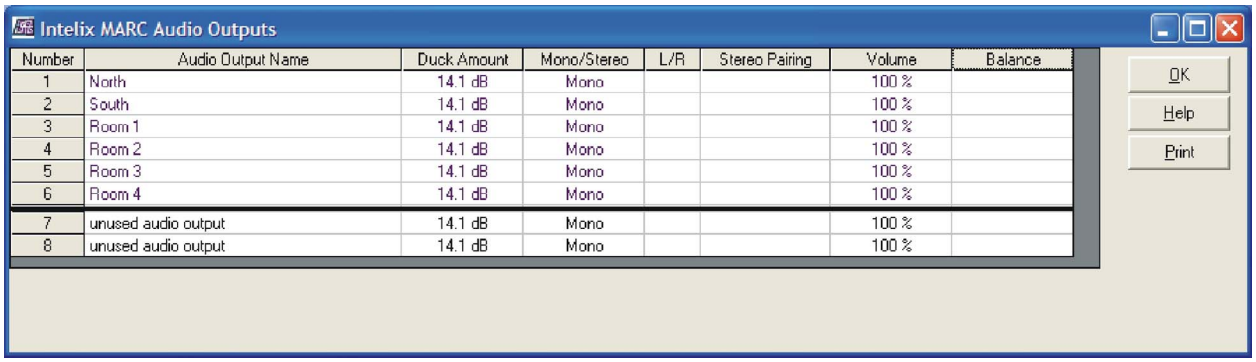


Fig. 9m MARC E Pan Value Left

9.2.3 Audio outputs

The audio outputs screen is primarily informational; the only parameter that is alterable exclusively from this screen is ducking.



Number	Audio Output Name	Duck Amount	Mono/Stereo	L/R	Stereo Pairing	Volume	Balance
1	North	14.1 dB	Mono			100 %	
2	South	14.1 dB	Mono			100 %	
3	Room 1	14.1 dB	Mono			100 %	
4	Room 2	14.1 dB	Mono			100 %	
5	Room 3	14.1 dB	Mono			100 %	
6	Room 4	14.1 dB	Mono			100 %	
7	unused audio output	14.1 dB	Mono			100 %	
8	unused audio output	14.1 dB	Mono			100 %	

Fig. 9n MARC E Audio Outputs Window

9.2.3.1 Output names

Output names (same as room names) cannot be changed from this screen. To change names go to the Room Details screen or the Room Name section of the Room Group screen. Any change to the room names on those screens will be reflected on the Audio Output screen.

9.2.3.2 Ducking

Ducking is the lowering of background audio during pages. You can alter the amount of ducking on a per room basis. To change duck amount, click on the ducking column for the output to change. Type in the new value. The range of ducking is 0-100 per cent. A typical duck amount is 20 per cent.

9.2.3.3 Mono/stereo

The mono/stereo parameter of a room cannot be changed on this screen. To change this parameter go to the Room Details screen. Any change to the room names on those screens will be reflected on the Audio Output screen. Note that changing a room from mono to stereo will use an extra audio output; the two outputs will be titled “Room L” and “Room R”.

9.2.3.4 L/R and stereo pairing

These two columns show which signals correspond to the left and right halves of stereo outputs. Neither columns can be altered on this screen. These columns will be blank for mono outputs.

9.2.4 Maximum audio levels

This screen allows you to set the “full scale” volume of any audio crosspoint. This means that when a user turns a Comet Tail volume control up all the way. They will be at the volume you define here. This allows the contractor to avoid customers “blasting” audio accidently.

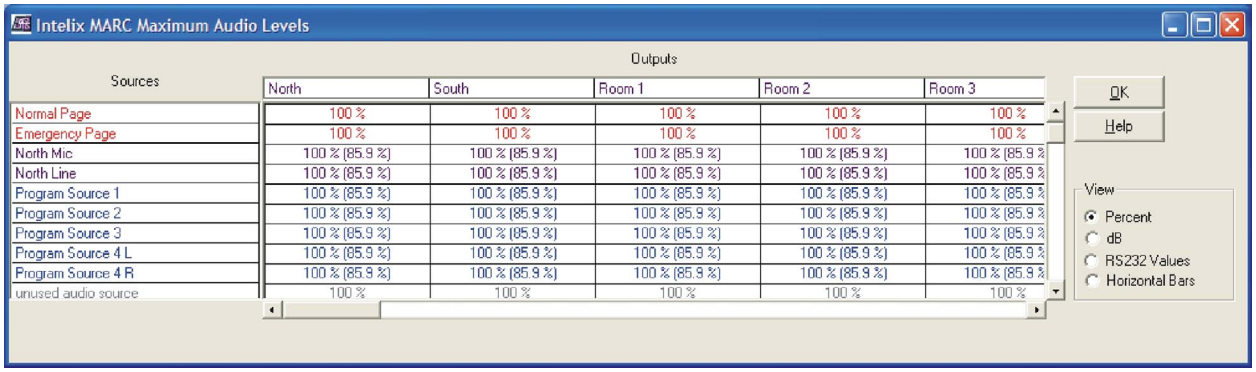


Fig. 9o MARC E Maximum Audio Levels Window

9.2.4.1 Setting crosspoints

To set the maximum level of a crosspoint, click on the crosspoint. Now use the up/down arrows or direct text entry to set the desired level. Double-clicking a crosspoint toggles it repeatedly between 100% and 0%; i.e., full off and full on. Note that 0% (off) is represented by a blank cell. This feature is useful for testing and setup.

9.2.4.2 Changing names

On this screen you are allowed to change the names of audio sources and audio outputs. To change a name click on the name and enter the new name. This change ripples through all screens that display the affected name.

9.2.4.3 Views

There are several options for viewing the crosspoint levels. They are selectable in the view button frame.

9.2.5 Paging ramp times screen

After the system is assembled, the remotes are programmed, and page and program levels set, there are two items left to adjust before testing: duck amounts and ramp times. MARC implements auto-ducking, meaning that pages into a zone automatically duck (reduce) the volume of program material, so that the page can be more clearly heard. This section explains how to set the parameters associated with ducking: duck amount (how much the program material is reduced during a page), ramp up and ramp down times (the rates at which the program material is ducked), and page ramp times. There are four parameters associated with ramp times:

1) **Program source duck time**: the amount of time the program material ramps down when a page becomes active.
2) **Program source return time**: the time the program material takes to return to its prepage level after a page.
3) **Page source ramp up**: the time for a page input to reach full paging volume.
4) **Page source ramp down:** the time a page input to return to zero volume after a page.

As shown in Fig. 9p, the screen allows entry of values for all four parameters. An interactive graph shows the magnitude and relationship among the four parameters. The parameters are limited to values between 0 and 30 seconds.

The “Set Duck Amount” button allows you to change the amount of ducking for each output from this screen. Duck amounts can also be set in the Audio Output screen.

9.2.5.1 Changing the paging ramp time parameters

1) Either click and hold down the up/down arrows on the spin boxes, or make direct text entry into the boxes. If you use the arrow method, you can watch the graph interactively change to the new values.
2) If you wish to alter ducking amounts, click the “duck amount” button, and enter the new values in the resulting screen.

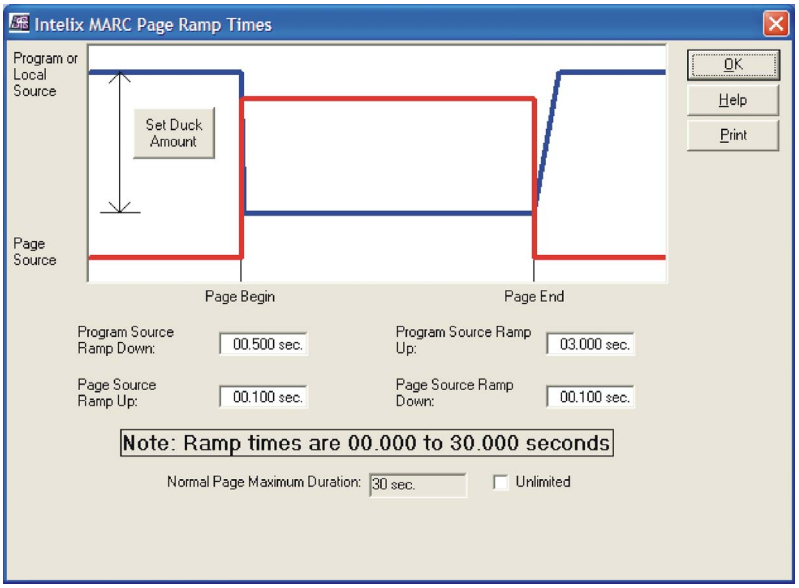


Fig. 9p MARC E Paging Ramp Times Window

9.2.6 DC control

This screen provides information and debugging capabilities for the DB25 connector on the rear panel of the MARC chassis.

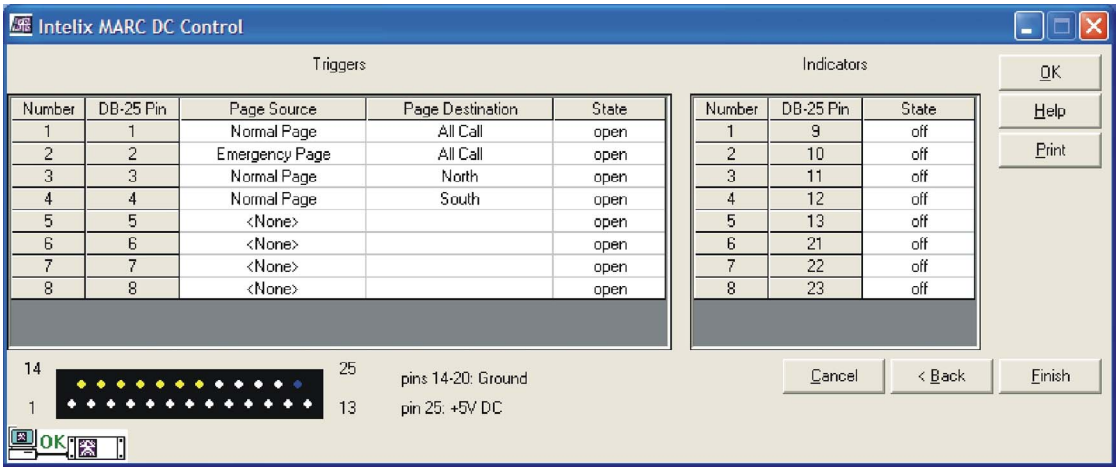


Fig. 9q MARC E DC Control Window

9.2.6.1 Number and DB25 pin columns

There are eight page trigger inputs numbered 1-8, and eight output indicators numbered 1-8. Each trigger and each indicator is wired to a specific pin on the DB25 connector. This pin is shown in the DB25 pin column.

9.2.6.2 Page source columns

The page source column allows the selection of any or none of the two paging sources. A pick list containing “none”, “normal page”, or “emergency page” appears when you double-click the page source column.

9.2.6.3 Page destination columns

The page destination column offers a pick list that routes the page to any or all rooms in the design. If rooms are combined that have a page routed to them, they will both receive the page routed to either.

9.2.6.4 Page trigger state column

If your PC is connected to a MARC matrix mixer, you can simulate a trigger closure by double-clicking on the trigger’s state column. This acts exactly as if you had pressed a contact closure on that trigger pin. You can thereby simulate a trigger activation even before the contact closure hardware is in place.

9.2.6.5 Indicator state column

If your PC is connected to a MARC matrix mixer, you can activate an output indictor by double-clicking on that indicator’s state column. This enables you to test DB25 connector to external devices wiring.

9.3 Reports Menu

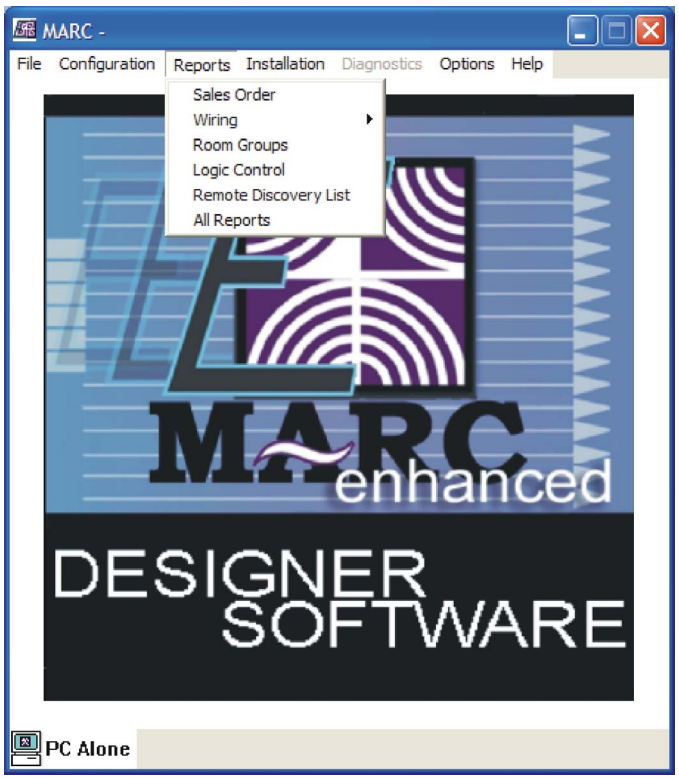


Fig. 9r MARC E Reports Menu Dropdown

9.3.1 Sales order

This form provides a convenient way to order an MARC system and related equipment from Intelix.

The “To” field is automatically filled out to route your order to the proper Intelix department. After the first time you fill out the "Bill to" field, it will be filled out automatically. The “Ship To” field defaults to the same as the “Bill To” field.

Note: Changes to the “Bill To” field are stored in your computer and will be used for subsequent files. The “Ship To” field affects only the current file.

The “Part Number” fields will be filled in with the components required for the design you have completed.

You need fill out only the Purchase Order (PO) number at the top of the form and the ship to address (if different from the default). Then print the form and fax or email it directly to Intelix.

9.3.2 Wiring submenu

The wiring submenu allows you to examine and print wiring lists for all part of your design (sources, outputs, and DC control), either individually or all at once.

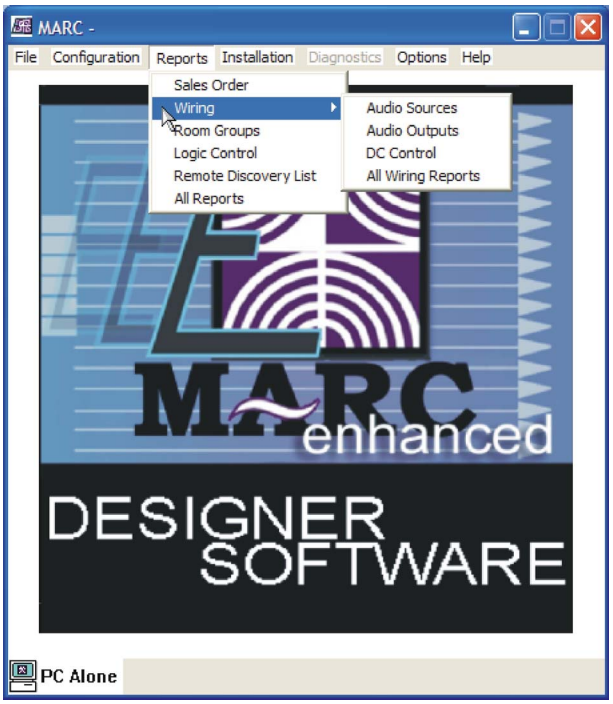


Fig. 9s MARC E Reports Menu displaying Wiring Dropdown

9.3.2.1 Audio sources wiring

This item prints the report showing all audio inputs with their names and attributes.

9.3.2.2 Audio output wiring

This item prints the report showing all audio outputs with their names and attributes.

9.3.2.3 DC control

This item prints a report showing all DC connector pin assignments including page sources and destinations.

9.3.2.4 All wiring reports

This item prints all reports, including audio source wiring, audio output wiring, and DC connector pinout.

9.3.3 Room groups

This item prints information about the room groups, such as names, configuration, which wall sensors are present, input and output settings, etc.

9.3.4 Remote discovery list

This item prints a list of all remotes in the system. A copy of this list is imperative when the remote discovery process is begun. You will visit and exercise remotes in the order specified by this list.

9.3.5 All reports

This item prints all reports in the Report Menu. This is a useful selection when doing final documentation for a design, since the entire design can be printed and filed for future needs.

9.4 Installation Menu

The installation menu allows access to screens used in installing and debugging the MARC system.

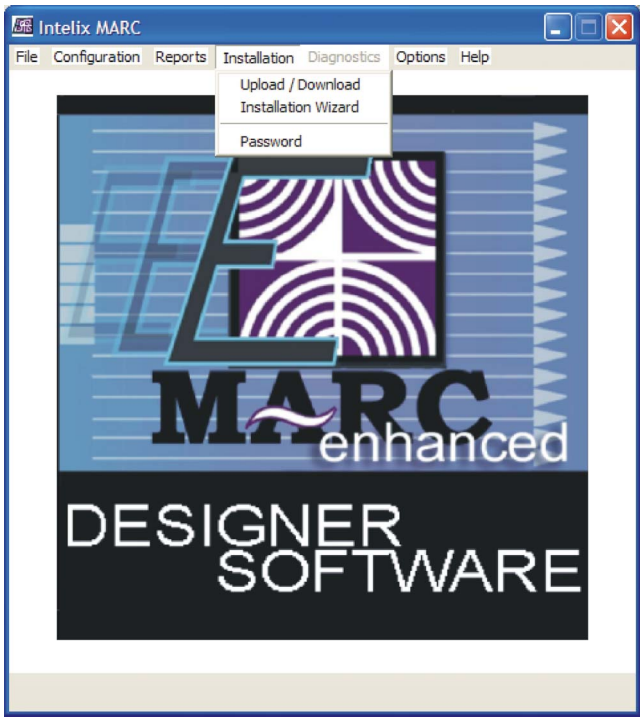
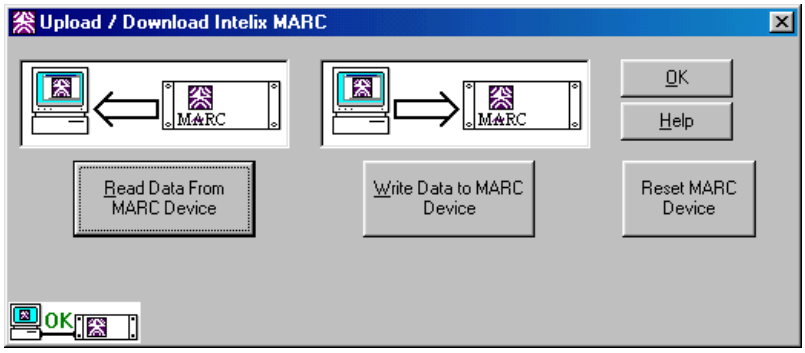


Fig. 9t MARC E Installation Menu Dropdown

9.4.1 Upload/download



This item brings up the screen shown in Fig. 9u and allows uploading/downloading (to and from the MARC) and resetting the matrix.

Fig. 9u MARC E Upload/ Download Window

9.4.1.1 Read data from MARC device

This item allows the user to load the currently open file with the data from an MARC hooked up to the PC. For this option to work, the PC must have already established communication with the MARC. After communication is established, the MARC will transfer all its programming to the PC. The data will be stored in whatever file is open when the "MARC device to PC" command is issued. This can be an existing file or a new one, as the user wishes. A typical use of upload is to modify an existing MARC application. The user would transfer the file to the PC; make the modification, and use "PC to MARC device" (described below) to send the new configuration back to the MARC.

9.4.1.2 Write data to MARC device

This item allows the user to transfer the current file on the PC to the MARC connected to the PC. After establishing communication between the PC and the MARC, the PC will send the currently open file to the MARC, which will store it in its local memory. After transfer, the MARC can be put in Discovery Mode and configured to run the new program. A typical use of PC to MARC device is to send a new design to the MARC.

9.4.2 Installation wizard

This selection initiates the MARC Installation Wizard; the Installation Wizard is treated separately in Section 7.0.

9.4.3 Password

The MARC system is provided with password control for user who will use the MARC Designer software to control the system. The password function allows users to make live changes to audio, while preventing them from altering names and audio types. This feature can be enabled/disabled by the installer.

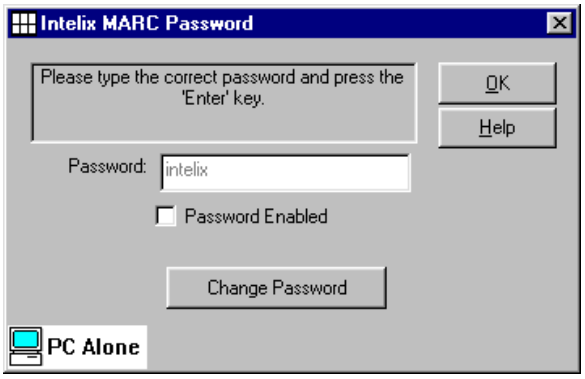


Fig. 9v MARC E Password Window

9.4.3.1 Enabling/disabling the password

To enable or disable the password, follow the steps below.

9.4.3.1.1 Enabling the password

To enable password protection, click on the "Password Enabled" check box. Type the password (*the password is case sensitive*). Press *Enter*. Now the entire program is available and password protection is disabled. To re-enable password protection, open the password screen and click the "Enable Password" check box. The program will tell you that the password is enabled.

9.4.3.1.2 Changing the password

To change the password, open the password screen and follow these steps:
1) Click the "Change Password" button.
2) Type the new password in the text field.
3) Click OK.
4) Check/uncheck "Enable password" as desired.

9.5 The Diagnostics Menu

Selecting the Diagnostic Menu gives access to the informational and diagnostic function as shown in Fig. 9w.

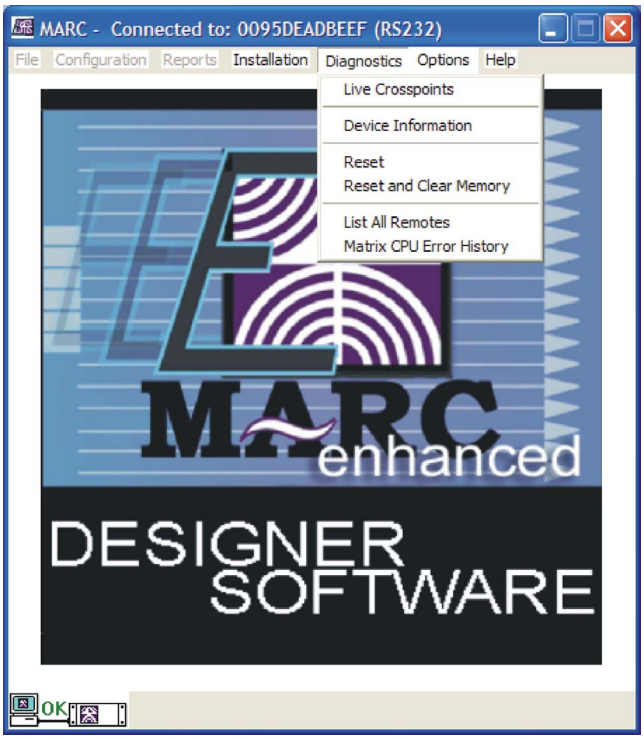


Fig. 9w MARC E Diagnostics Menu Dropdown

9.5.1 The *Live Crosspoints* item

This item bring up a screen showing the grid of all existing matrix crosspoints with their current levels displayed. For testing and diagnostic purposes, the levels in the Live Crosspoint screen can be altered. Changes in this screen take effect immediately.

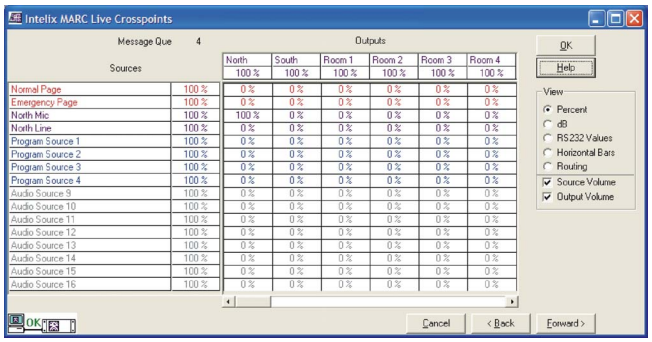


Fig. 9x MARC E Live Crosspoints Window

Using the scrollbars on the matrix, locate the crosspoint you wish to change; double-click the crosspoint. A pop-up allows a new value to be entered. Click *OK*. Changing the level of a member of a stereo pair changes both members.

Views

The view of the crosspoints is selectable among percent (0-100%), dB (-100 dB to 0 dB), vertical and horizontal bar graphs. The "**Routing**" view selection allows you to look at the state of the routing bit for each crosspoint. A crosspoint that is not routed will not be retained after a power cycle. To manually route a crosspoint, change the view to routing and place a check on crosspoint.

The maximum levels allowed at a given input or output are controllable from this screen. The view of these parameters can be turned on and off by checking/unchecking the *Input Volume* and *Output Volume* boxes. These values correspond to the virtual input and virtual output VCAs as explained in Section 1. To change these values, make them visible by clicking the appropriate check box, then double-click the value to be changed. In the resulting pop-up, type the new value and click *OK*.

9.5.2 The device information item

The Device Information screen presents information general to the MARC system.

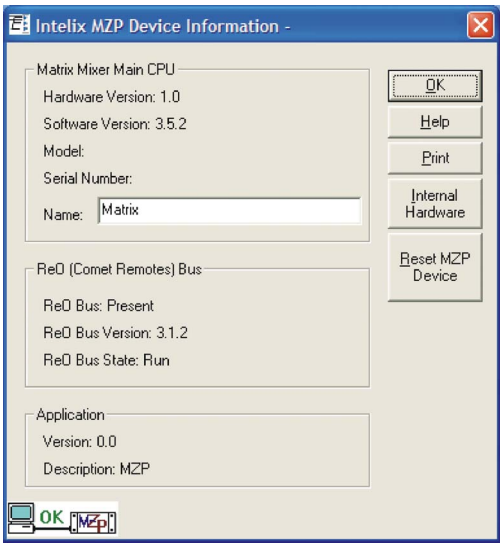


Fig. 9y MARC E Device Info Screen

9.5.2.1 The name of the matrix

The matrix name is a text string of up to 32 characters. You can change the name by clicking the name and entering the new name.

9.5.2.2 Device information

Displays the model number, hardware, and software version numbers; not alterable by the user.

9.5.2.3 ReO bus status

Shows the current status (present or absent) of the ReO bus and bus state (run or discovery), as well as version number. If the ReO bus is not present, the "ReO bus version" and "ReO bus State" fields are grayed out.

9.5.2.4 Application software

Any special application software present on the machine will be displayed in the "Special Application" area.

Note: All "E" MARC models have an application version of 4.0 or higher.

9.5.2.5 Memory reset

Pressing the *Reset* button leads to a screen allowing the erasing of the matrix's memory, resetting the MARC device.

9.5.2.6 Internal hardware item

The *hardware configuration* button shows the user what audio crosspoint boards and mic/line cards are present in the system. Each cell represents an 8 x 8 crosspoint card. Non-responding boards are shown in red, while responding boards are shown in green. The window is scrollable to show all areas of the potential 128 x 128 matrix. Double-clicking any cell brings up a window displaying the status of the board at that location.

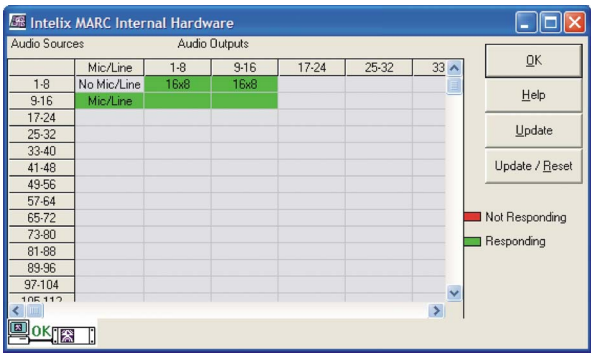


Fig. 9z MARC E Internal Hardware Window

9.5.2.6.1 Crosspoint board status

This window appears when the user double-clicks a cell in the internal hardware screen. It displays information about the crosspoint board at the address selected.

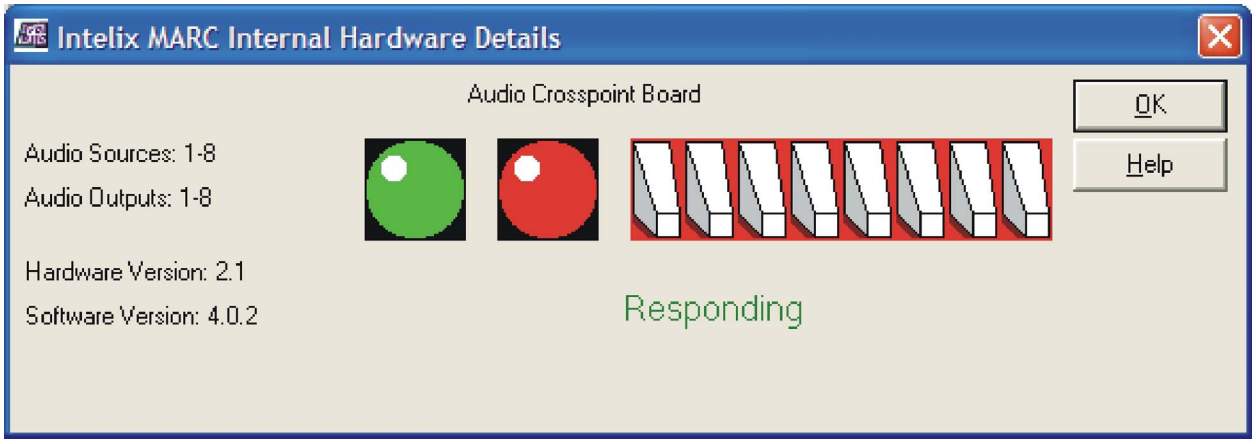


Fig. 9aa MARC E Crosspoint Board Status Window

The information on the screen includes the addresses covered by the board, the hardware and software versions of the board (blank if the board is not responding), whether or not the board is responding, and the necessary DIP switch settings for the installation of a board at that address. The addressing DIP switches will appear identical on adjacent cells because a single 16 x 8 board covers two sequential addresses.

Note: This screen appears whether the selected cell actually contains a board or not. If you select a cell that does not have a board, it will say “Not Responding” in red letters. If the board exists and is operating properly, the window will say “Responding” in green letters.

9.5.2.6.2 Mic/line status

This screen appears as a response to double-clicking the mic/line column of the internal hardware screen. It shows input range, hardware, and software versions (blank if board is not responding), whether or not the board is responding, and the necessary DIP switch settings for the installation of a mic/line board at that address.

9.5.3 Reset

This option resets the matrix hardware, leaving the system program intact.

9.5.4 Reset and clear memory

This button erases all matrix memory and resets the matrix hardware. All system programming will be lost. ***We highly recommend that you back up your system file before using this function, otherwise valuable time and programming effort may be lost.***

9.5.5 List all remotes

This option opens a grid with detailed remote information, such as Station Type, Remote Name, ID, and address. This screen is printable and allows you to reset remote devices.

9.6 The Options Menu

Selecting the Options menu gives access to the communication information.

Fig. 9bb MARC E Options Menu Dropdown

Note: Communication Icons

All screens carry a communication icon in the lower left corner. The icon in the lower left corner will indicate the current state of communication. There are three communication icons:

This icon indicates that the PC is not attempting to communicate with an MARC matrix mixer. In this mode you can create new files and design systems for later transfer to an MARC. In PC alone mode some functions may be disabled.

This icon indicates correct communication between the PC and the MARC. You can transfer files, monitor the MARC or make live real time changes in this mode.

This icon indicates a communication failure. Common causes are incorrect communication port selected, incorrect baud rate, or cabling errors.

9.6.1 Are You There

A clock in the MARC software periodically (every three seconds) sends a message (Are You There) to the matrix. This feature allows the software to continually verify the correct communication between the software and the matrix hardware. When the correct acknowledgment message (I Am Here) is received, the software refreshes the communication OK icon in the lower left of the window. If the I Am Here message is not received, the software assumes a communication failure has occurred and displays the broken link icon.

Normally, the Are You There item should remain active (checked). However when you are doing diagnostic troubleshooting using the Test manager, you may find that the Are You There messages are filling up the communication buffer. In this case, simply uncheck the Are You There item for as long as you use the message buffer, then turn it back on.

9.6.2 Connection manager

The MARC Connection Manager is a grouping of Designer Software functions useful in troubleshooting problems with the matrix hardware software or application. It contains all communication setup control, as well as manual RS232 messaging capability.

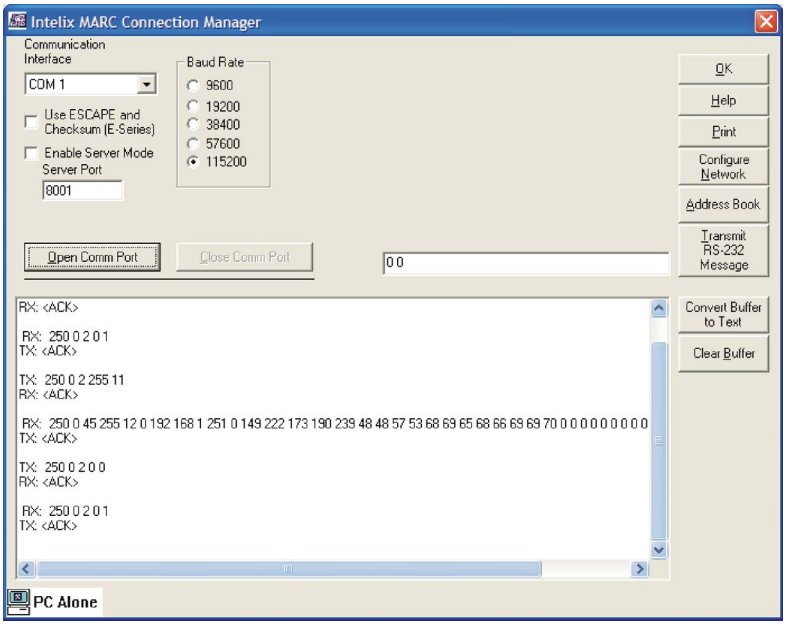


Fig. 9cc MARC E Connection Manager

9.6.2.1 Communication interface

The port you select from the communication interface drop-down must be present in your system and unused by any other peripheral in your system. If you choose a nonexistent or in-use port, a warning will appear. IP is enabled here.

9.6.2.2 Use Escape and Checksum

If your controller allows it, using escape and checksum can minimize the error rate over your communication link. If your controller does not allow the use of escape and checksum, uncheck this item.

9.6.2.3 Baud rate

There are five available baud rates: 9600,19200, 38400, 56700, and 115200. Choose whichever rate best suits your system. The rate you choose *must be matched by the DIP switches* on the back of the MARC.

9.6.2.4 Open comm port

This button activates the communication port you have selected. To begin communication with the MARC you must open the port. If your settings selections have been correct, the communication icon in the lower left of the screen will change to OK; if the MARC does not respond the icon will show the broken link.

9.6.2.5 Close comm port

No settings can be altered while the communication port is open. If you need to change any settings to the port, you must first close it. Click the "Close port" button, make the changes and click "Open port". Be sure to recheck the communication icon to ensure that communication is correctly established.

9.6.2.6 The message buffer

The lower part of the RS232 Test Manager comprises the RS232 Message Buffer and its controls. The buffer displays the RS232 messages that are sent and received by the matrix. This function can be extremely useful in creating and debugging applications for the Intelix matrix.

9.6.2.6.1 Clear buffer

The "**Clear Buffer**" button deletes the contents of the RS232 message buffer window. The operation has no effecton the operation of the matrix. Clearing the buffer becomes necessary when the messages of interest are scrolled outside of the window's range.

9.6.2.7 Transmit RS232 message

The "**Transmit RS232 Message**" button causes the Designer Software to transmit the contents of the message window out the currently selected communication port to the matrix. The message window requires the message format shown below.

Message Format:

first number: class number (one decimal number) followed by a space.
second number: message ID: (one decimal number) followed by a space.
third and subsequent numbers: message parameters (one decimal number each) each followed by a space.

Note: All numbers are decimal and must be delineated by spaces. Messages with their classes, IDs and parameters are detailed in this manual.

Shown in Fig. 9dd is an example of a message typed into the message window ready to send by clicking the **Transmit RS232 Message** button.

This example message represents Class 1, ID 9 Goto I/O Volume. The parameters are i/o flag = 0 (output) i/o number = 2 and new volume = 255. When the **Transmit RS232 Message** button is selected, this message will be sent to the matrix.

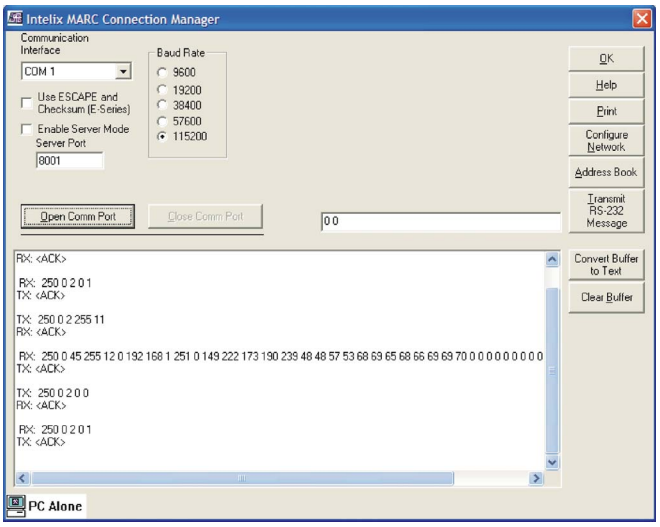


Fig. 9dd MARC E Connection Manager Window

9.6.2.8 Address book

This options opens an address book containing systems which have been connected to the MARC system. These addresses are cached connections.

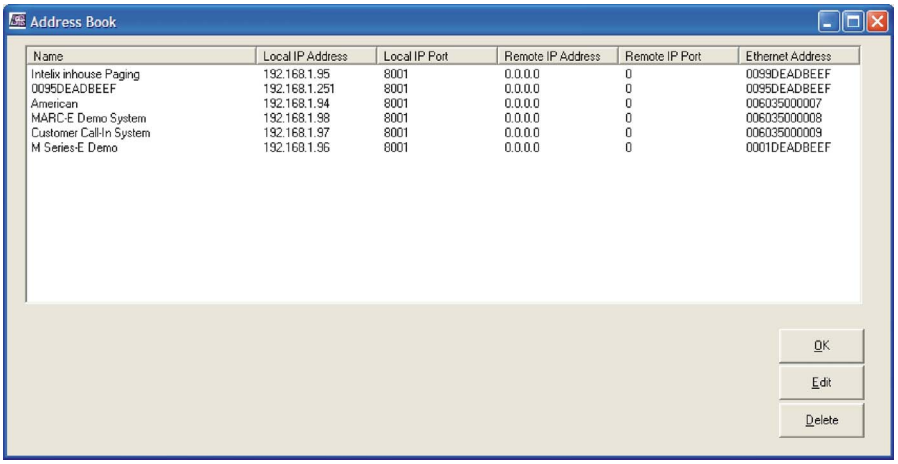

Address Book
Name
Local IP Address
Local IP Port
Remote IP Address
Remote IP Port
Ethernet Address
Intelix inhouse Paging 192.168.1.95 8001 0.0.0.0 0 0099DEADBEEF
0095DEADBEEF 192.168.1.251 8001 0.0.0.0 0 0095DEADBEEF
American 192.168.1.94 8001 0.0.0.0 0 006035000007
MARC-E Demo System 192.168.1.98 8001 0.0.0.0 0 006035000008
Customer Call-In System 192.168.1.97 8001 0.0.0.0 0 006035000009
M Series-E Demo 192.168.1.96 8001 0.0.0.0 0 0001DEADBEEF
OK
Edit
Delete

Fig. 9ee MARC E Address Book Window

9.6.2.9 Network configuration

This options allows you to configure network settings when connecting to a MARC device. It is best to consult with the local IT personnel before toggling settings on this screen.

Options include: Ethernet address, Name, IP address, Subnet Mask, Default Gateway, and DHCP Server.

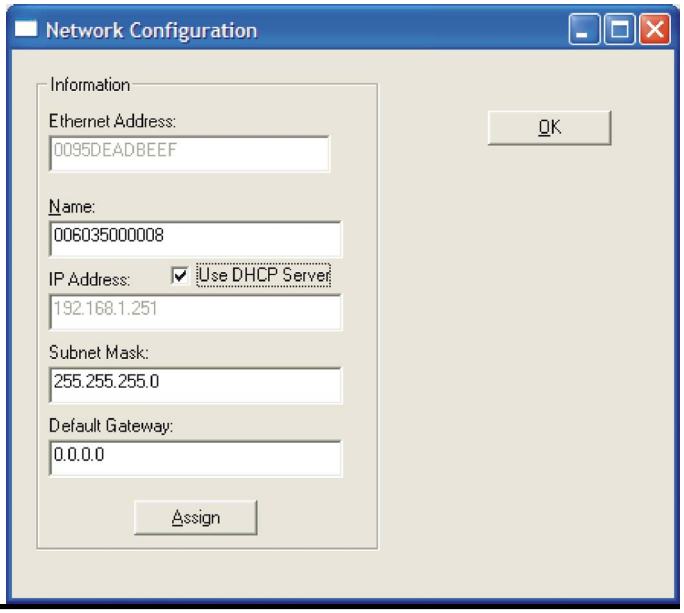


Fig. 9ff MARC E Network Configuration Window

9.6.2.10 When IP is enabled

When IP is enabled in the Connection Manager, several options are present for toggling your IP connection. You can choose a local or remote connection, toggle the IP address and port, as well as select the connection from the Name drop-down.

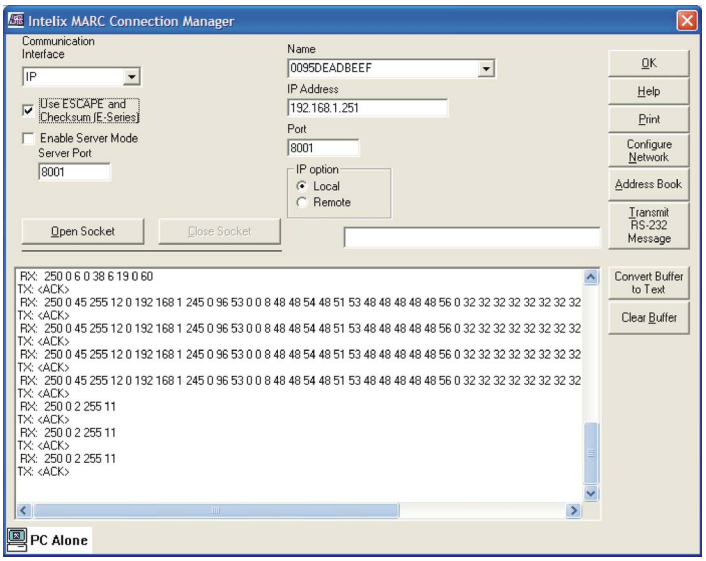


Fig. 9gg MARC E Connection Manager with IP enabled

9.6.3 Network nodes

The Network Nodes option toggles a screen where you can query for Intelix devices on the network. Once queried, these devices are selectable in the Communication Manager.

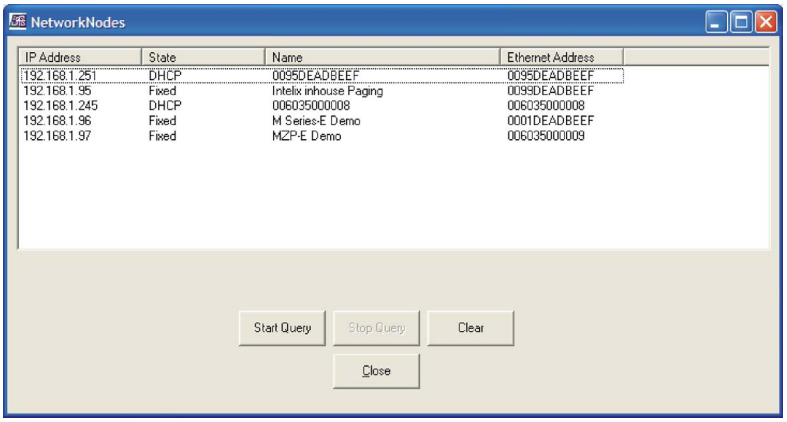


Fig. 9hh MARC E Network Nodes Window

9.6.4 Client/Callout setup

This option establishes a simple firewall by adding ethernet addresses to the user list. Callout triggers the MARC to act as a server and "call out" to an ethernet address.

Note: If no addresses are entered into the Authorized Client List, all users will be able to connect. When addresses are entered, only the entered addresses will be able to connect. When entering addresses, **make sure to enter the address you are using first.** Otherwise you will be locked out of the system.

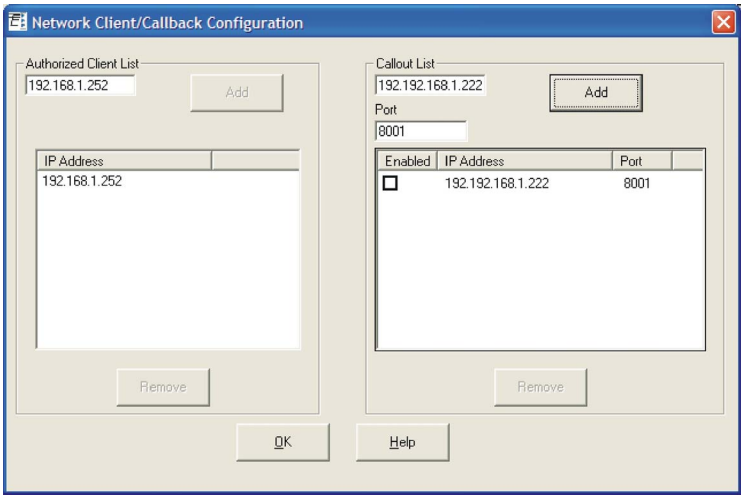


Fig. 9ii MARC E Client/Callout Window

When connecting via the internet, the client's IP address is the internet gateway addresses. Keep in mind that everyone using the same gateway address will have access to the box.

9.6.5 Import

This option allows the importing of address books into the MARC software for IP connectivity.

9.7 The Help Menu

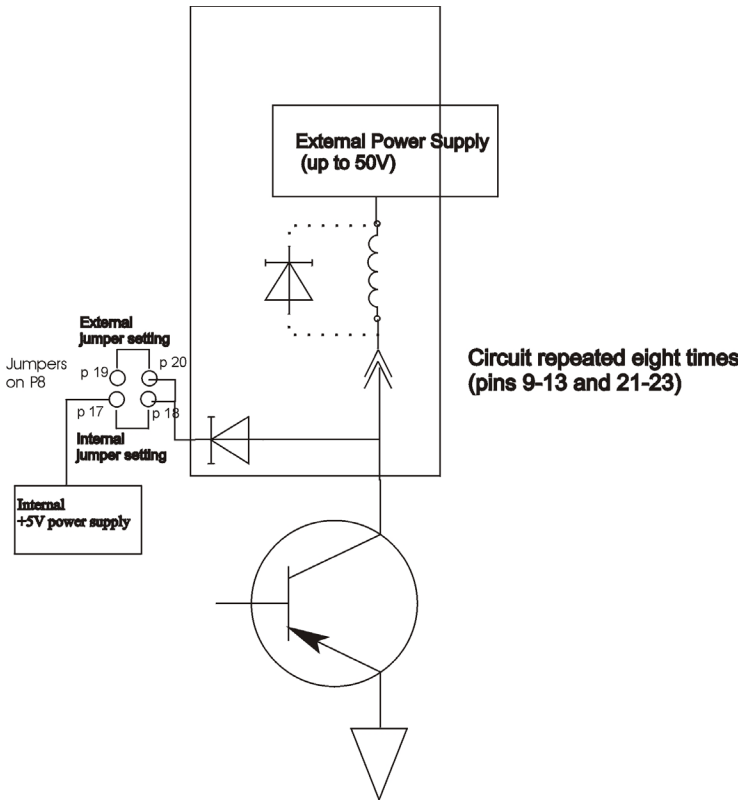
The help menu offers a Table of Contents, an index, and a Find function according to Windows® standard practice.

Appendix A: Using an External Power Supply

For powering external devices through the DB25 connector there are two choices. If your devices can be run on +5VDC with a total current draw of 500 mA or less, then you can use the internal power supply, which is brought out to pin 25 of the DB25 connector. If you use the internal supply *with an inductive load*, you must change the jumper setting to the internal setting on P8 as shown below (for location of P8 see next page). If your devices require a higher voltage or current, you can use an external supply. This requires the following steps:

1) connect your supply, (up to +50 VDC) to pin 24 of the DB25 connector.
2) change the setting of the power supply jumper to the external setting as shown below.
Note: The factory default setting has the jumper in the external position.

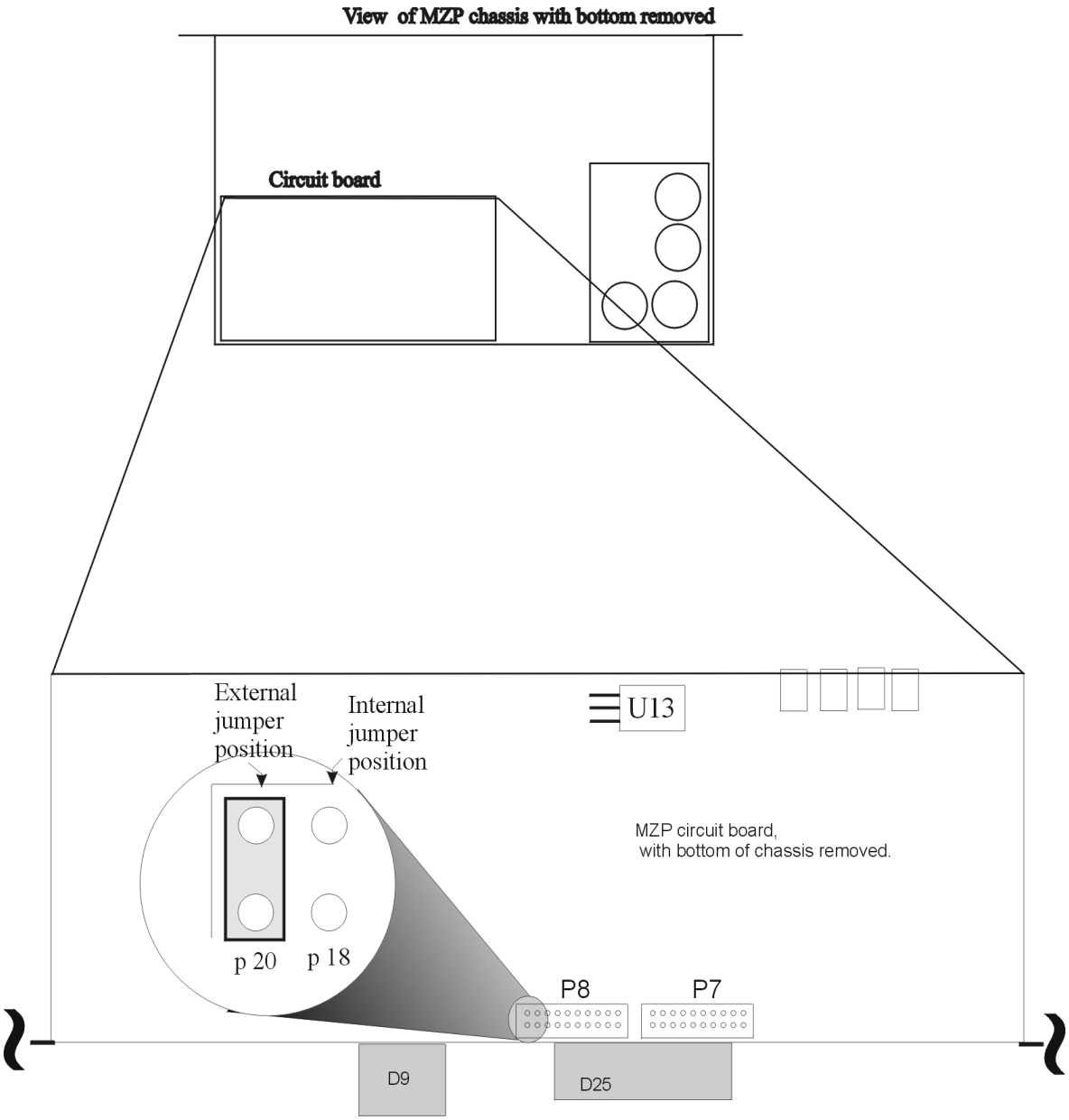
This drawing shows the equivalent circuit of a binary output with the jumpers for selecting internal or external flyback protection. The jumpers shown are on jumper block P8 (see next page). Each of the 8 binary outputs has this circuit. If the jumper setting uses the internal flybacks, the shown external flyback is not needed.



AB 1 Warning
Placing jumpers in both positions will short out and destroy the internal power supply! For internal flyback use the jumper should be between pins 17 and 18 on the jumper block. For external flybacks, the jumper should be between pins 19 and 20. There should be a jumper in one or the other of these positions NEVER BOTH!

The drawing below shows the circuit board with the bottom of the chassis removed, exposing the location of the jumpers for internal and external flyback selections. For external flybacks, place the jumper between pins 19 and 20 of P8 (shown). For internal flybacks, place the jumper between pins 17 and 18 on P8. ***Never place jumpers in both positions!***

Caution — component U13 may be **HOT**!



Warning: Placing jumpers in both positions will short out and destroy the internal power supply! For internal flyback use the jumper should be between pins 17 and 18 on the jumper block. For external flybacks, the jumper should be between pins 19 and 20. There should be a jumper in one or the other of these positions NEVER BOTH!

Appendix B: Power Supplies and Grounding

AC power supply

ReO devices are usually powered by a 12 VAC transformer. The transformer secondary is connected *in parallel* to all the remotes in the system at pins 1 and 3 of their power connections. The ground return for the data signals is provided by pin 1 of the Phoenix connector. The remotes' electronics are grounded to the matrix via the *data* connection ground.

Note: If static is an issue or may be an issue (i.e., if the area if carpeted or in dry conditions), pin 2 of the ground connector must be tied to a facility ground for drainning static away from the electronics.

DC power supply

If the ReO devices are powered by a DC voltage supply, and the DC supply has *floating or isolated outputs*, then the grounding connections to the ReO remotes should be the same as for an AC supply, as described above.

Note: When using a grounded DC supply, the presence of the bridge rectifiers in the remotes will cause there to be a 0.7 V common-mode difference between the DC supply ground and the remote ground. This difference is negligible compared to the common-mode rejection capabilities of the RS485 transceivers.

Matrix AC power connection (external supply versions of the matrix)

The manufacturer supplies an 18 Volt, 3.0 Amp center-tapped transformer to power the mixer. If another AC supply is used instead, it should be of equal voltage and have at least a 60 Volt-Amp rating. The details of the **AC Power Jack** on the rear panel are as shown in Fig. A1.

Matrix DC power connection

The mixer can also be connected to a DC power supply via the Phoenix-style **DC Power Jack** on the rear panel. The DC supply can be used as:

1) the sole power source, or

2) an on-line backup.

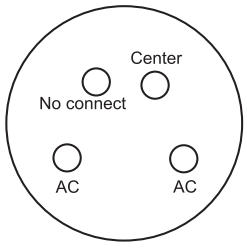


Fig. B1 4-pin DIN Connector, viewed from the rear of the Matrix.

Note: If the DC supply is used as backup, it **must** meet the following voltage requirements:

♦A regulated supply (e.g., battery) must be 18 volts or less (using a voltage of less than 17V will reduce the dynamic range of the mixer when the main supply is off).

♦An unregulated supply (e.g., generator) must be between 17 and 18 volts.

Otherwise, the mixer will draw from the backup supply even when AC power is supplied. The current supplied must not be less than 3.0 A. The wire configuration, voltage, and current requirements are as shown in Fig. A2.

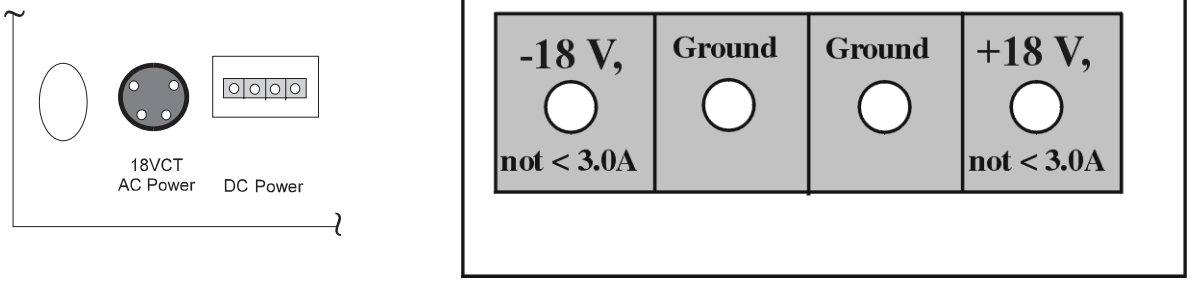
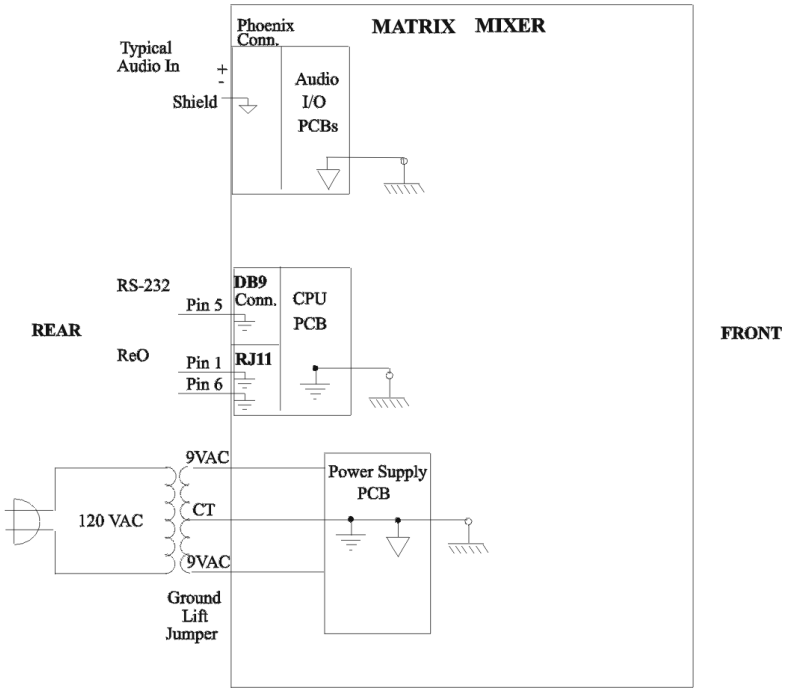


Fig. B2 Rear Panel View

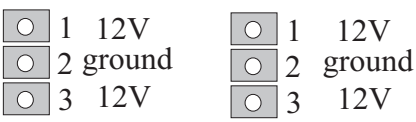
Matrix grounding

The chassis for the matrix provides the main ground for all internal PC boards. There is also a wire ground system to each board to ensure ground connection in the event the chassis is disassembled.

Note: There is *no* connection to the building ground via the AC power supply. Building ground can be supplied through the chassis or shield connections, or through the ground pins on the DC power connector.



ReO power and grounding



This drawing shows the relative positions, within the Comet Tail and the Comet 4, of the three pins of the ReO power connections. **Pin 2** is always grounded, **Pins 1 and 3** are powered (12 V, AC or DC).

Appendix C: Signal-to-Noise Considerations

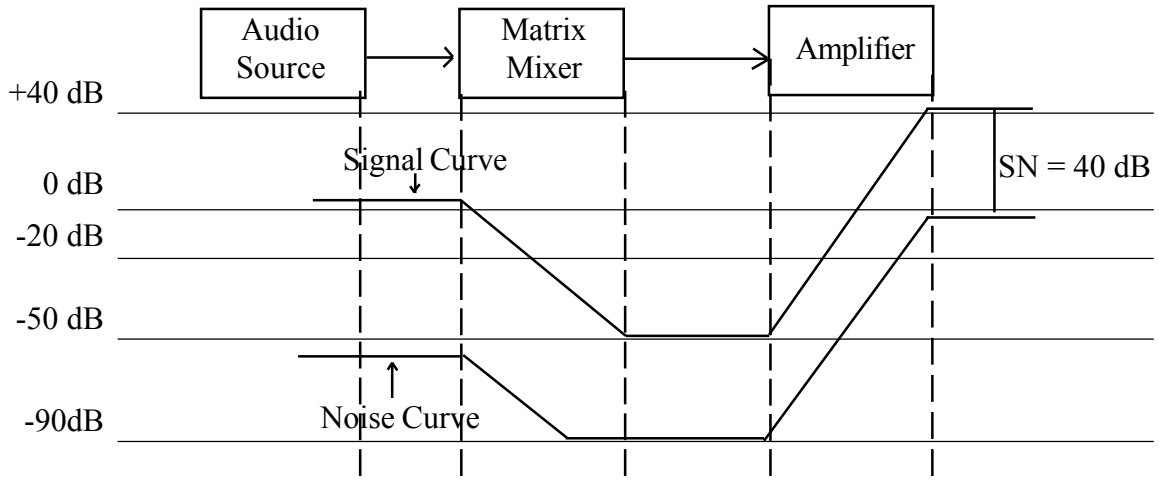
The MARC matrix audio crosspoints are attenuation only devices. When all the level controls are fully on, there is unity gain through the crosspoints and output cards; and when fully off, there is attenuation of –100dB. To obtain optimum audio performance of the matrix, provide it with input signals of +4dB or greater. Depending on whether the input is balanced or unbalanced, the maximum input level should be no more than approximately +25dB. (When mic/line input cards are used, input gain stages should be set to provide at least +4 dBu to the crosspoint boards.)

To maximize the signal-to-noise ratio, and to take full advantage of the performance of the matrix, it is important to balance the system levels with most of the gain occurring before the signal enters the crosspoint boards, rather than in the power amplifier afterwards. The matrix has an absolute noise floor of betten than –80 dB. Proper level balancing, using the signal source capability of +26 dB, can result in signal-to-noise ratios of more than 100 dB. Using the power amp to raise signal levels, rather than a pre-matrix amplifier or the matrix itself, diminishes this high level of performance.

The Intelix mic/line input card can be used to boost input signals of less than +4dB to the optimum levels for the matrix.

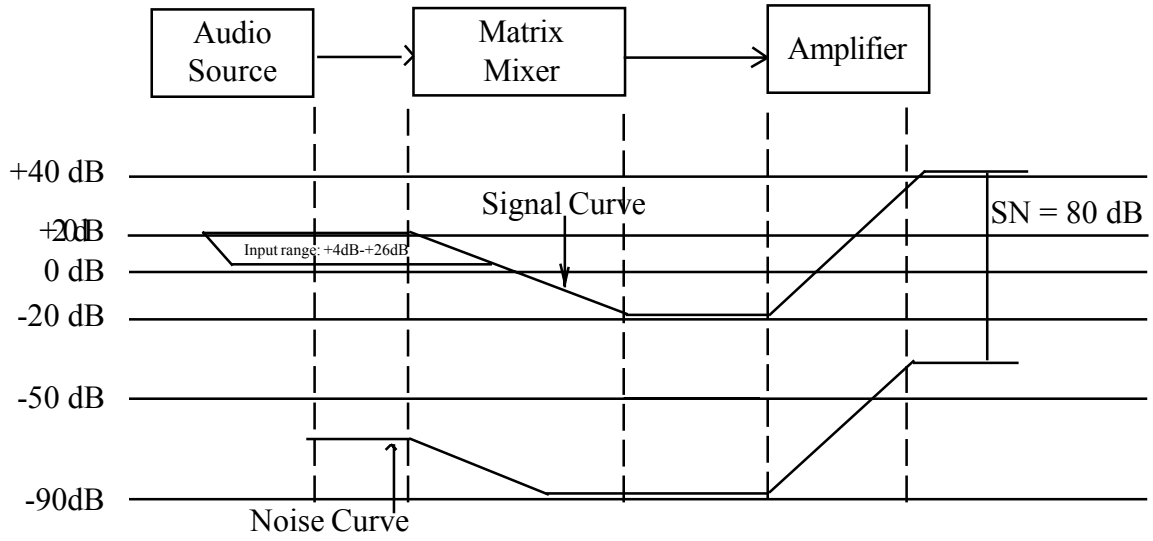
System balancing
To take full advantage of the matrix's high signal-to-noise performance, take the following steps:

♦ Drive the matrix inputs with a signal of +4dBm to +26dBm or mic/line input card.
♦ Set all matrix VCAs at 225 (linear scale) or 132 (log scale).This is 12dB of attenuation and allows for a signal level increase of 12dB and a decrease of 88dB.
♦ Adjust the post matrix system; i.e., power amplifiers to produce the desired listening levels in the room or zone with this nominal setting of the matrix.



The above drawing shows the signal-to noise performance when the user attenuates a +4dB signal by 50 dB through the matrix. This scenario commonly occurs when the user sets the matrix attenuation controls at the nominal mid-point in an effort to have maximum adjustment range. However, since the control is attenuation only, the nominal midpoint is actually 50dB *of attenuation.* This setting results in the relatively poor signal-to noise ratio seen here.

This drawing shows the result of correctly following the system balancing procedure detailed above. The input signal is in the range of +4dB to +26 dB. With the matrix attenuation controls set to -12dB the input signal is attenuated to -8dB. The resulting signal-to-noise ratio is improved to more than 80dB.



Appendix D: MARC Reset Sequence

MARC Reset Sequence

1) Power goes down, reset button is pressed or a software reset command is received.
2) Within a half second the matrix stops passing audio.
3) If power has failed, the matrix memory is switched to battery backup, preserving the current settings.
4) Power returns to normal levels.
5) The matrix begins to restore the current settings of crosspoints across a five second ramp up.
6) After the five second ramp time all crosspoints have been restored to their pre reset levels.
7) The main CPU will accept input commands after a 30 second reboot period.

Note: If during the five second reset ramp the matrix receives an external message from a Comet 4, a Comet Tail, or any RS232 controller, *the external message will override the five second ramp time.* If a full system reboot occurs, including power cycling of all remotes, it may take up to 30 seconds for the remotes to be recognized and fully functional.

Appendix E: Comet Remote Devices

Intelix Comet Series Remotes are single gang control modules for the Intelix MARC system. Typically wall-mounted, Comet remotes function as convenient user interfaces for paging, program source selection, and volume control.

The carefully optimized design allows the Comet remote controls to conveniently interconnect in LAN bus topology. Up to 128 remotes can be utilized with one MARC matrix mixer via ReO bus communication. Each remote's "personality" is then easily assigned using the MARC setup and control software. This "personality" can easily be reassigned as applications change.

Comet Tail

The Comet Tail is a digital remote control device designed for volume control and mute functions. The volume function takes advantage of a rotary encoder, giving the user a knob as the control device. The volume knob is encircled by eight red LEDs to indicate level status. The LEDs move in a clockwise direction with the brightest LED indicating the current level position. The mute function is controlled via a momentary button and corresponding red status LED. The mute function is latching as dictated by software and "LED-on" indicates the mute function is active.

Comet 4

The Comet 4 is a digital remote control device designed for source selection or page routing functions. Each remote has four momentary buttons and four corresponding red status LEDs to indicate when a selection has been activated.

Using the MARC setup and control software, a Comet 4 can be programmed to function as a program selector. In this mode, each of its four buttons enables users to select one of four audio sources for a given zone. Multiple remotes can be used if more than 4 sources are required in a program selection station.

A Comet 4 can also be programmed to function as a paging station. In this mode, each of the four buttons selects the room or zone to which a page will be routed. Multiple remotes can be used if more than four destinations are required. LEDs indicate when a page is successful, or blink to indicate a zone is already being paged into from another location.

Technical Specifications

Power requirements

9 - 18 Volts (AC or DC); One power supply required per 10 remotes

Current draw

100 mA

Power connector type

3 pin - Phoenix connector; phase tolerant

Recommended power wire

2 conductor stranded, 18 AWG

Max. powerwire length

(18 AWG Belden 8461, West Penn 224)

Number of Remotes	12VDC supply voltage	18VDC supply voltage
1	4000 ft. 1220 m.	12000 ft. 3660 m.
4	1200 ft. 366 m.	3600 ft. 1098 m.
8	600 ft. 183 m.	1800 ft. 549 m.
16	300 ft. 91 m.	900 ft. 275 m.
32	150 ft. 46 m.	450 ft. 137 m.
64	75 ft. 23 m.	225 ft. 68 m.
128	33 ft. 10 m.	112 ft. 34 m.

Data communication

RS485 ReO bus

Data connector

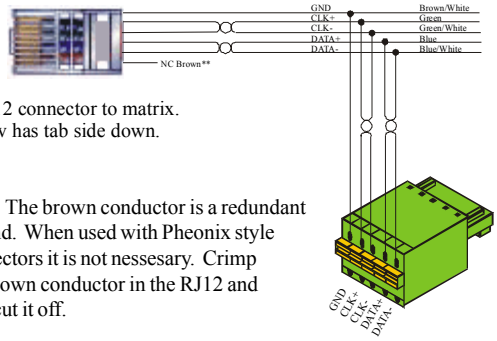
6 pin - RJ12 modular jack or 5 pin Phoenix connector

Supplied Accessories

2 - 6/32' mounting screws1 - female 3 pin IDC power connector

Data connection topology

Phase critical, parallel wiring, twisted pair data and clock.

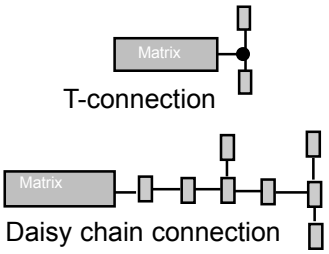


RJ-12 connector to matrix. View has tab side down.

Note: The brown conductor is a redundant ground. When used with Pheonix style connectors it is not nessesary. Crimp the brown conductor in the RJ12 and then cut it off.

Data Connection Topology

T-connections, daisy-chain, and star acceptable



Recommended data wire

Category 3 e.g. Belden 1245A or West Penn WP52995

Maximum data wire length

12000 feet (4000 m)

Appendix F: Technical Information

SPECIFICATIONS

Signal-to noise Ref +26 dBV, 8X8 system	100dB
Frequency Response	±½ dB from 20 Hz to 20 kHz
+0, -3 dB from 10 Hz to 30 kHz	
Crosstalk	Better than -80 dB
Gain Control Range (attenuation only)	100 dB
Gain Control Resolution	0.4 dB (256 steps)

Inputs

Input Impedance (electronically balanced)	20 kΩ
(unbalanced)	10 kΩ
Nominal Source Impedance	150 Ω
Nominal Input Level	+4 dBV RMS
Maximum Input Level (balanced)	+26 dBV RMS

Outputs

Output Impedance (electronically balanced)	440 Ω
(unbalanced)	220 Ω
Nominal Load Impedance	600 Ω
Nominal Output Level	+ 4 dBV RMS
Maximum Output Level (balanced)	+26 dBV RMS
(unbalanced)	+20 dBV RMS

POWER REQUIREMENTS

8x8 to 16x16	18 VAC center-tapped, 3 A, 54 VA ±18 - 24 VDC, 3 A

DIMENSIONS

Matrix: (Standard models, 2U chassis)	19" x 3.5" x 14" (48.2 cm x 35.6 cm x 8.9 cm)

SHIPPING WEIGHT

Matrix (8 x 8 units, more for other models)	20.3 lb. (9.20 kg)

Servicing

All repair and other service of Matrix Mixers and Remotes should be provided only by qualified service personnel. Contact Intelix for a list of authorized service agents. *Other attempts at service or repair may void the warranty.*

Warranty

All Intelix products are guaranteed against malfunction due to defects in materials or workmanship for two years after date of purchase. If a malfunction does occur during the specified period, the defective product will be repaired/replaced, at Intelix's option, without charge. Furthermore, the "Fresh Start" program ensures that a product which has been repaired/replaced is itself gauranteed for an additional two years.

This warranty does not cover: 1) Malfunction resulting from use of the product other than as specified in the user manual; 2) Installation specific wiring; 3) Malfunction resulting from abuse or misuse of the product; 4) Exterior chassis appearance; 5) Malfunction occuring after repairs have been made by anyone other than Intelix or any of its authorized service representatives; 6) Acts of nature; 7) Optional embedded software upgrades or updates.

All repair and service of Intelix products should only be provided by qualified service personnel. Please contact Intelix for a list of authorized service agents. Other attempts at service or repair will void the warranty. Warranty service is only offered after a return authorization number has been generated by an authorized Intelix representative.

For Application, Warranty, Service, and Technical Support, please contact Intelix.

Intelix
8001 Terrace Ave.
Middleton, WI 53562

Phone: 608-831-0880
Toll-Free: 866-4-MATMIX
Fax: 608-831-1833

www.intelix.com
intelix@intelix.com

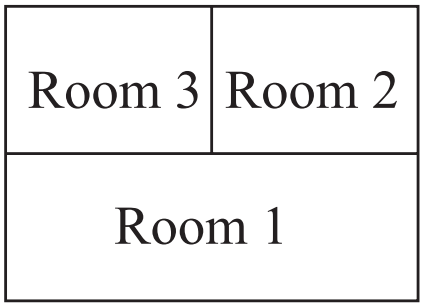
Appendix G: MARC Training Facility Design Example

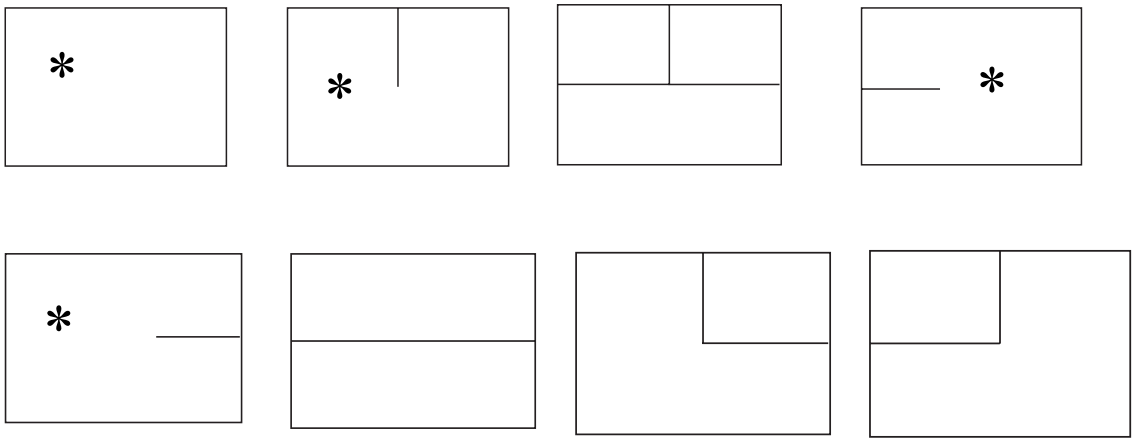
This appendix will present two design examples; one simple and the other relatively complex. The simple example is a small training facility and the complex one a conference center. Both designs are shown in their entirety.

Defining the Training Facility

This example shows the design of a small training facility.

There are three moveable walls. This means that the room group can be set up to be a single large space (two ways), three small spaces, or two spaces with the same or differing sizes. These eight configurations are shown below:

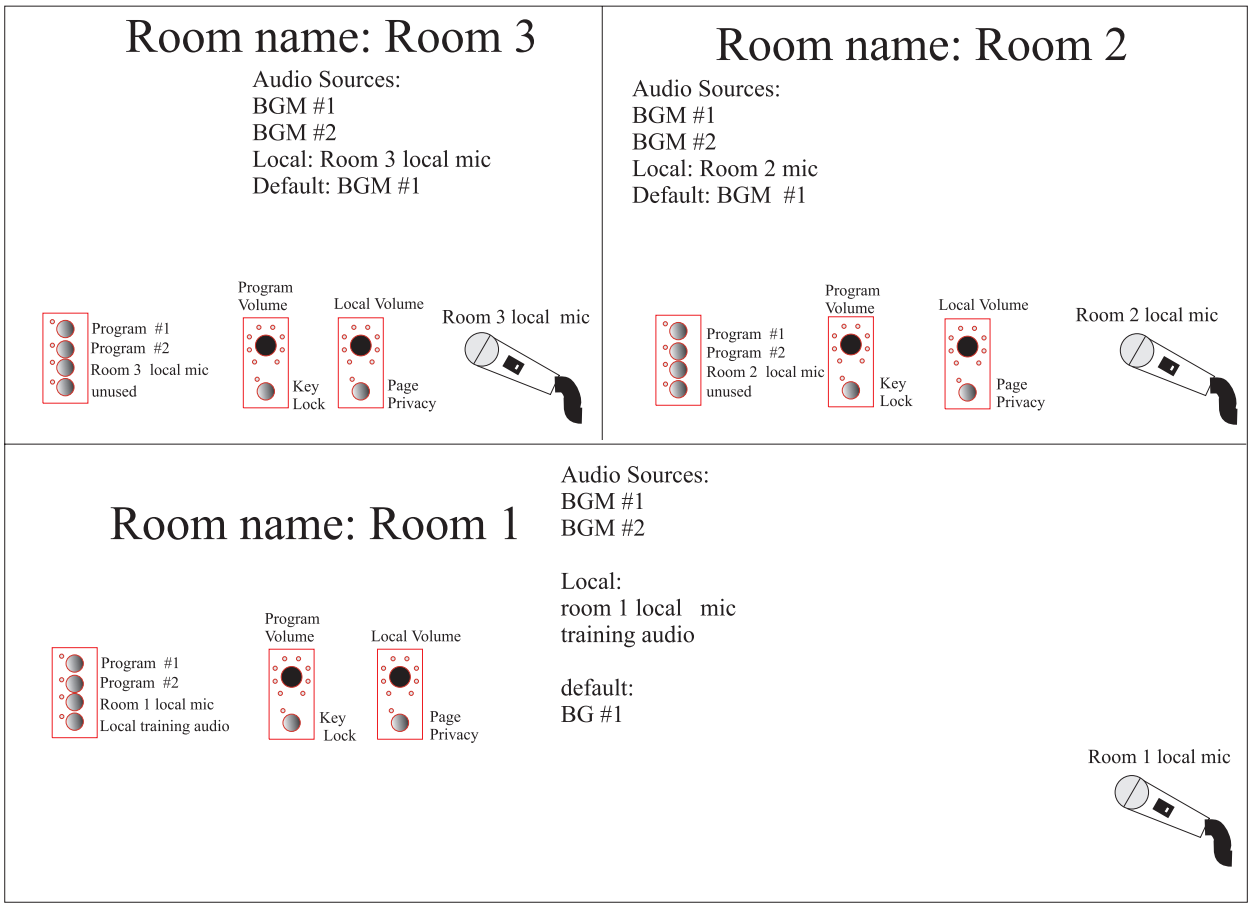




*All starred layouts are identical from the audio point of view. They are included for completeness only.

This drawing shows schematically the controls and audio sources in the training facility.

MARC Example #1 Training facility



Controls for Training Facility

Room 1:

1 Comet-4: selects one of two Background sources, room 1 local mic or local training audio.

2 Comet Tails: Program volume and local volume.

Room 2:

1 Comet-4: selects one of two Background sources, room 2 local mic, and one unused button.

2 Comet Tails: Program volume and local volume.

Room 3:

1 Comet-4: selects one of two Background sources, room 3 local mic, and one unused button.

2 Comet Tails: Program volume and local volume.

Listing of All Audio Sources for the Training Facility:

Room 1:
Program Sources: BGM #1 and BGM #2 (both stereo)
Local Sources: Room 1 local microphone and training audio
default source: BGM #1

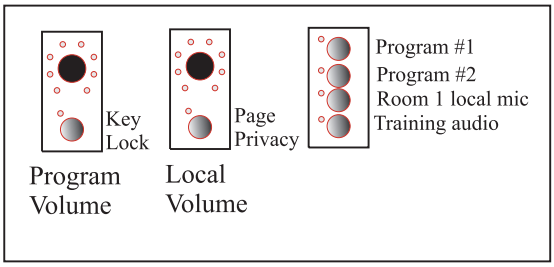
Room 2:
Program Sources: BGM #1 and BGM #2 (both stereo)
Local Sources: Room 2 local microphone
default source: BGM #1

Room 3:
Program Sources: BGM #1 and BGM #2 (both stereo)
Local Sources: Room 3 local microphone
default source: BGM #1

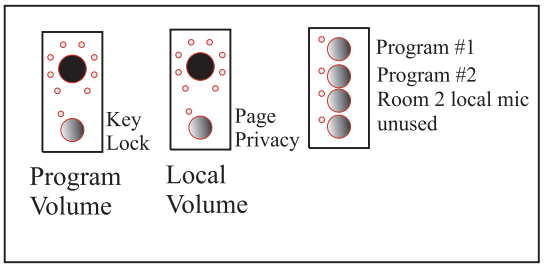
General:
Normal Page input (mono)
Emergency Page (mono)
Paging inputs are on the DB-25 connector on the Matrix rear panel.

Room Control Stations

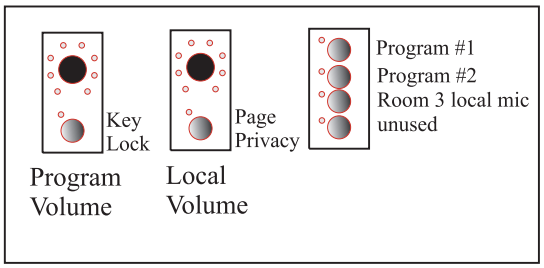
Each room has a Comet-4 remote for audio source selection, and a two Comet Tails remotes to control program and local source volume. The stations are shown schematically below:



Room 1: The buttons on the Comet-4 can select either (or both mixed) of the two Background Music sources, or one of the two local sources (room 1 local mic or training audio). The button on the program volume control is the station keylock. While active, the key lock prevents the station from being changed. The button of the local volume control toggles the page privacy feature. When page privacy is active, this room will receive no pages except emergency pages.



Room 2: The buttons on the Comet-4 can select either of the two Background Music sources, or the local microphone. The button on the program volume control is the station keylock. While active the key lock prevents the station from being changed. The button of the local volume control toggles the page privacy feature. When page privacy is active, this room will receive no pages, except emergency pages.



Room 3: The buttons on the Comet-4 can select either of the two Background Music sources, the local microphone or the local training audio The button on the program volume control is the station keylock. While active the key lock prevents the station from being changed. The button of the local volume control toggles the page privacy feature. When page privacy is active, this room will receive no pages, except emergency pages.

Default Sources

All three rooms use the same default source: Background Music #1. The default source become active when a wall is raised or lowered and can be any program or local source.

Using the MARC Designer Software® Wizard to Implement the Training Facility Design

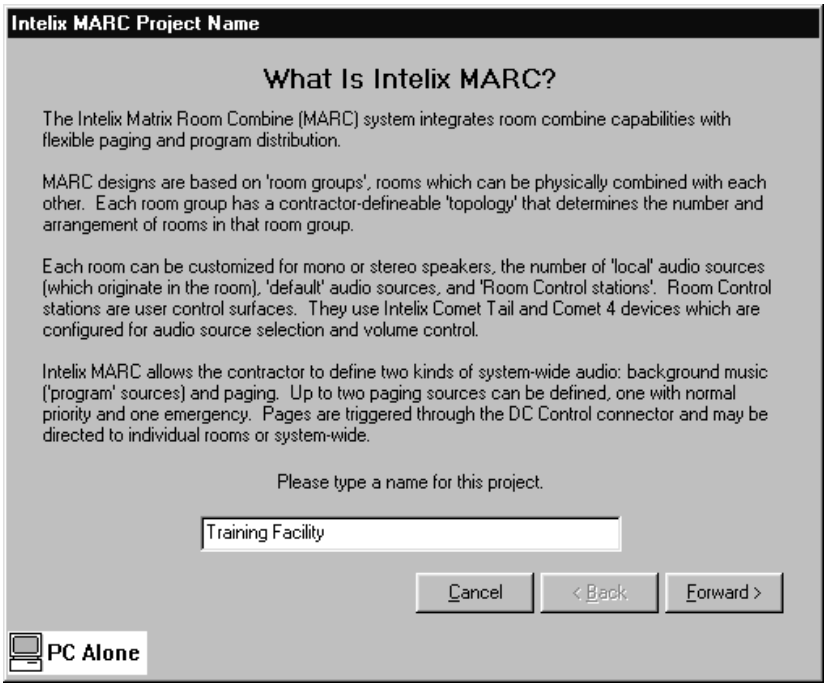
Start the Design Wizard

The design wizard starts when you select File -> New. You will be asked if you wish to use the wizard, Click OK.

Intelix MARC Auto Design Wizard
The Intelix MARC Auto Design Wizard guides you through a series of screens that completely define your application.
OK
Cancel

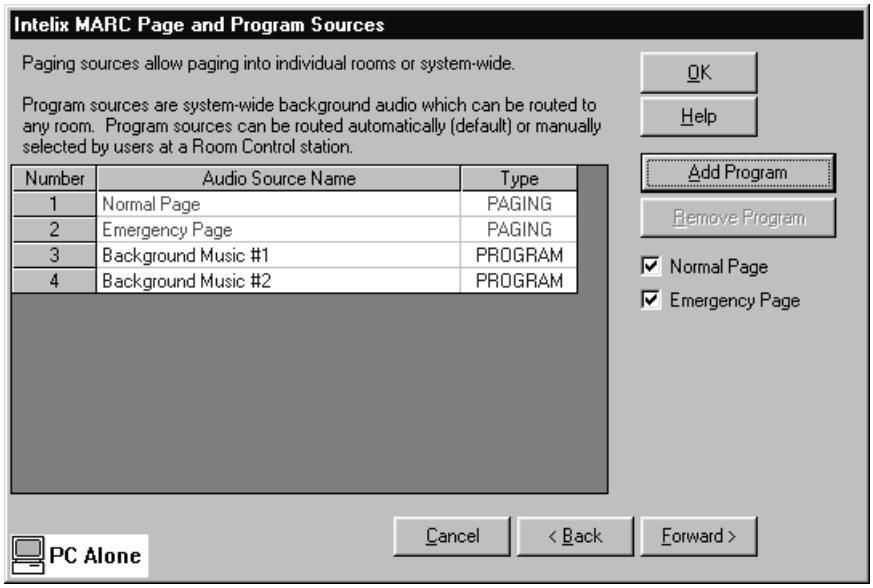
Name the Project

The first wizard screen has explanatory text and a name field, after you have entered the project name (shown here as “Training Facility”) click “Forward”.


Intelix MARC Project Name
What Is Intelix MARC?
The Intelix Matrix Room Combine (MARC) system integrates room combine capabilities with flexible paging and program distribution.
MARC designs are based on 'room groups', rooms which can be physically combined with each other. Each room group has a contractor-defineable 'topology' that determines the number and arrangement of rooms in that room group.
Each room can be customized for mono or stereo speakers, the number of 'local' audio sources (which originate in the room), 'default' audio sources, and 'Room Control stations'. Room Control stations are user control surfaces. They use Intelix Comet Tail and Comet 4 devices which are configured for audio source selection and volume control.
Intelix MARC allows the contractor to define two kinds of system-wide audio: background music ('program' sources) and paging. Up to two paging sources can be defined, one with normal priority and one emergency. Pages are triggered through the DC Control connector and may be directed to individual rooms or system-wide.
Please type a name for this project.
Training Facility
Cancel
< Back
Forward >
PC Alone

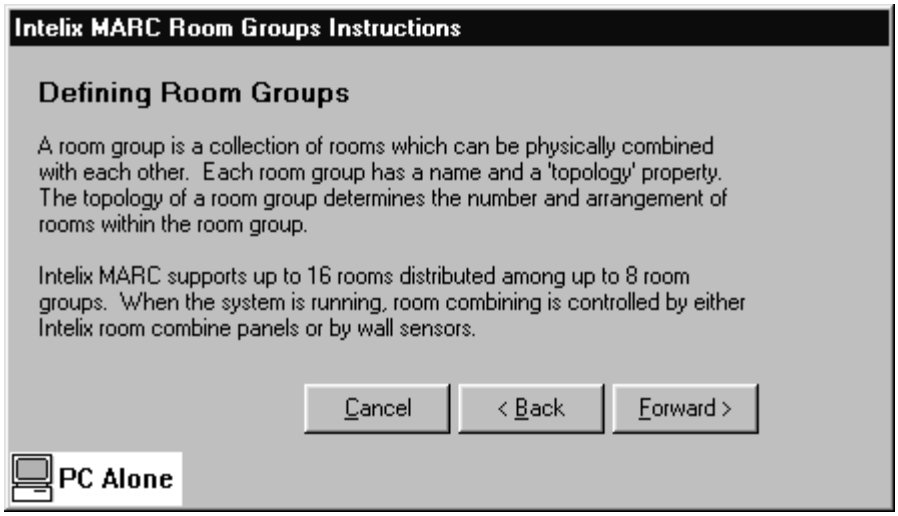
The Page and Program Source Screen

On this screen you name the page and program sources. To change the default names, click on the name, type the new name and click Enter. Repeat for each name to be changed. You can change the names of the two paging sources if you wish. As shown below, in this example we leave the paging source names alone, and set two program source names as Background Musi #1 and Background Music #2. The other two default sources are removed my clicking on them, then clicking the "Remove Source" button. When you have filled in this form, click "Forward".



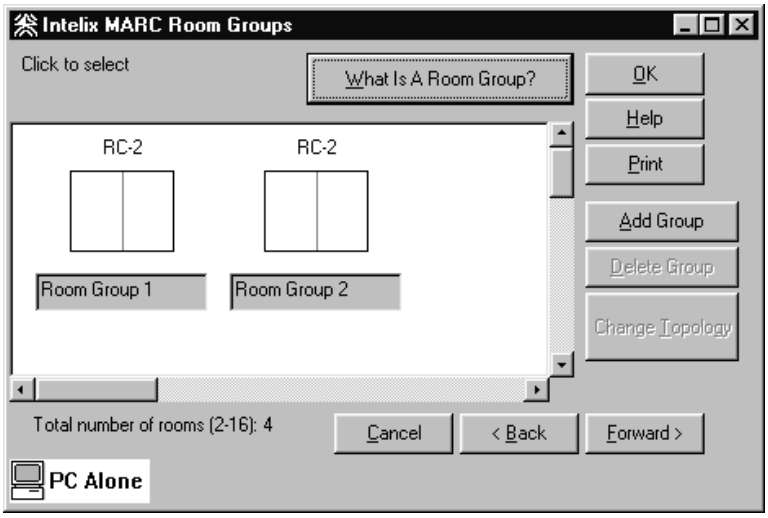
Defining Room Groups

The next screen in the wizard is an instruction only explanation of Room Groups. After you have read and understood the explantion of Room Groups, click "Forward".


Intelix MARC Room Groups Instructions
Defining Room Groups
A room group is a collection of rooms which can be physically combined with each other. Each room group has a name and a 'topology' property. The topology of a room group determines the number and arrangement of rooms within the room group.
Intelix MARC supports up to 16 rooms distributed among up to 8 room groups. When the system is running, room combining is controlled by either Intelix room combine panels or by wall sensors.
Cancel
< Back
Forward >
PC Alone

The Room Group Screens

On the room group screen you will delete the excess room group, and choose the approriate topology for the remaining room group. The room group screen before any changes is shown below.



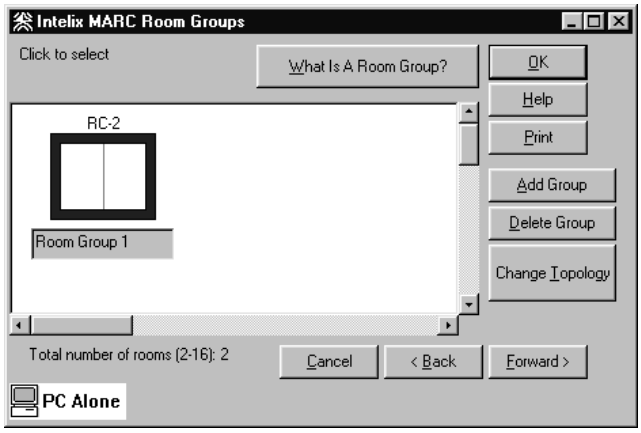
Delete the Extra Room Group

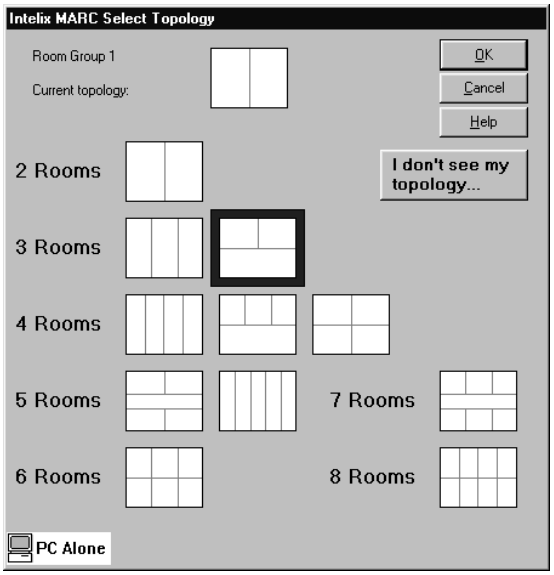
The wizard defaults to two room groups. Since the Training Facility only needs one, delete the extra group as follows: Click on either group (it highlights). Click the “Remove Group” button. The extra group is deleted.

Change Topology

This example needs the topology shown in the project definition. To change the group to the correct topology, follow these steps:

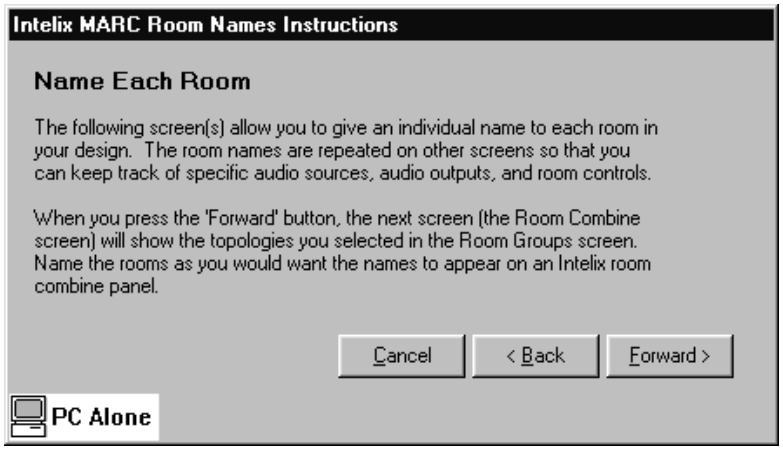
1) Click the room group (it highlights). This stage is shown below left.
2) Click the “Change Topology” button.
3) Select the topology desired as shown in the picture below right.
4) Click OK, and the new topology will be displayed.





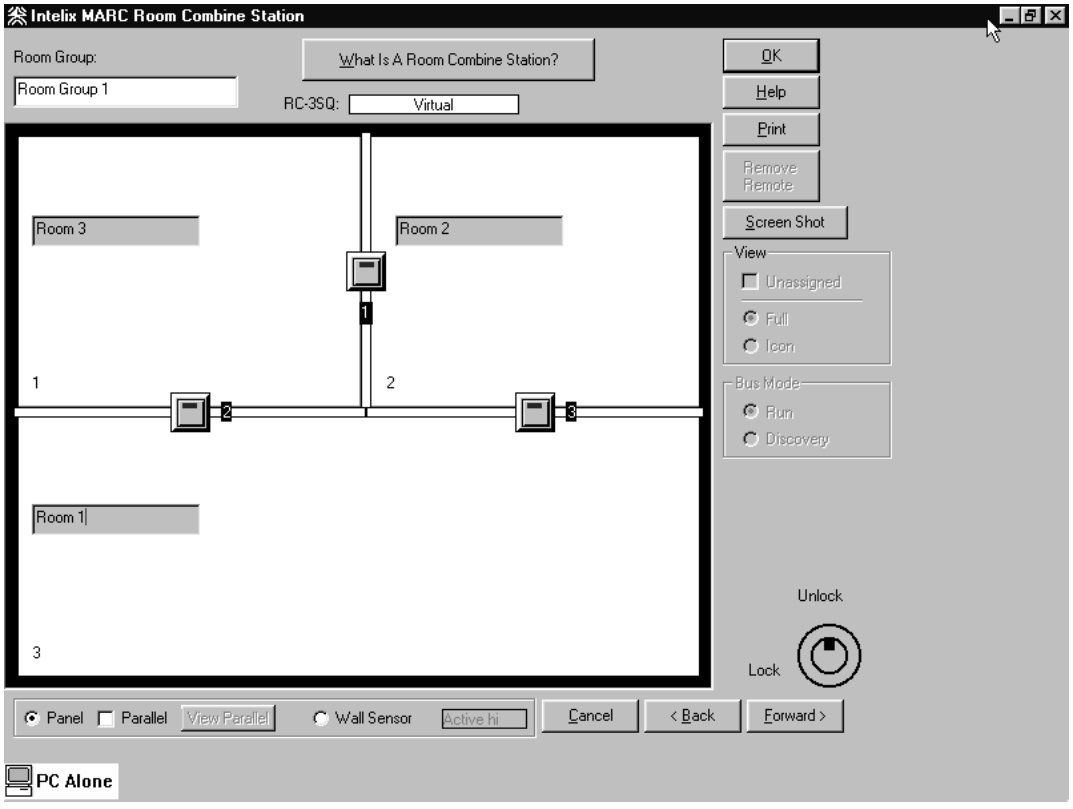
Name the Rooms

The next screens are concerned with naming the rooms in the Training Facility. The first screen is instructional only. When you have read and understood the instructions, click the “Forward” button.


Intelix MARC Room Names Instructions
Name Each Room
The following screen(s) allow you to give an individual name to each room in your design. The room names are repeated on other screens so that you can keep track of specific audio sources, audio outputs, and room controls.
When you press the 'Forward' button, the next screen (the Room Combine screen) will show the topologies you selected in the Room Groups screen. Name the rooms as you would want the names to appear on an Intelix room combine panel.
Cancel
< Back
Forward >
PC Alone

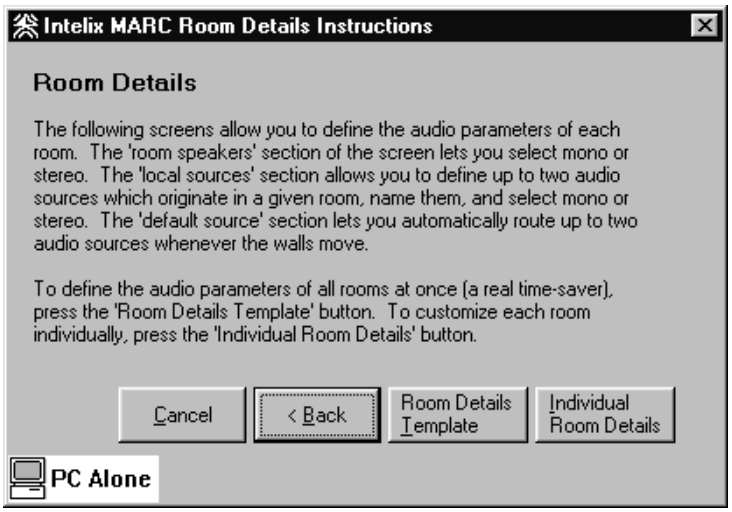
The Room Combine Station Screen

From this screen you will name each room in the design. Using the names from the design definition, enter the room names in each text block. Since this design uses a room combine panel, click the “panel” radio button at the bottom of the screen. When you have named the rooms, click “Forward.”



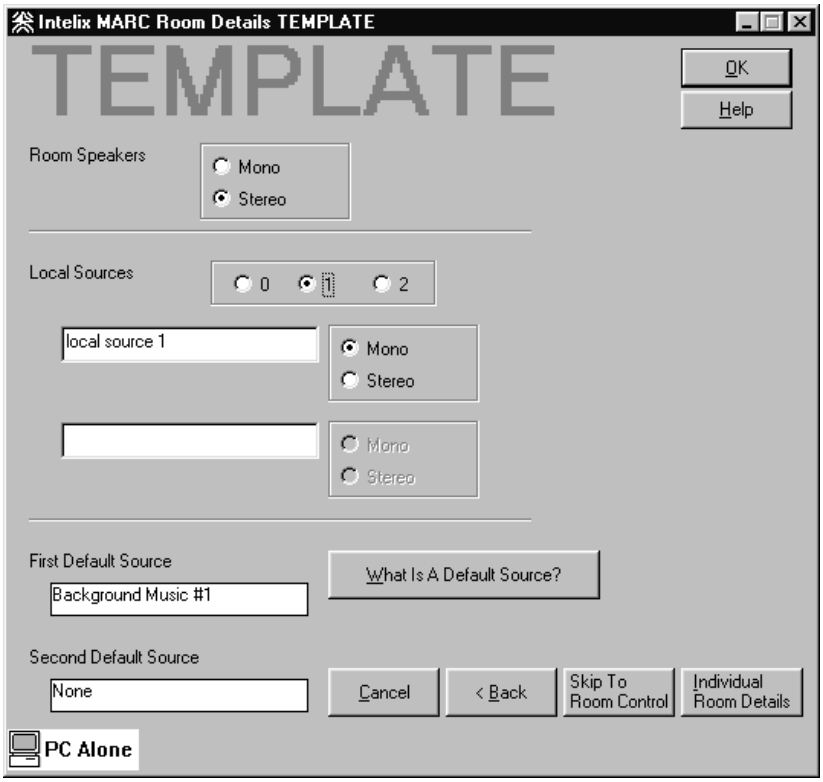
Room Control Screens

The next two screens are used to define room controls. The first screen is purely explanatory. After you have read and understood this screen, click “Forward.”


Intelix MARC Room Details Instructions
Room Details
The following screens allow you to define the audio parameters of each room. The 'room speakers' section of the screen lets you select mono or stereo. The 'local sources' section allows you to define up to two audio sources which originate in a given room, name them, and select mono or stereo. The 'default source' section lets you automatically route up to two audio sources whenever the walls move.
To define the audio parameters of all rooms at once (a real time-saver), press the 'Room Details Template' button. To customize each room individually, press the 'Individual Room Details' button.
Cancel
< Back
Room Details Template
Individual Room Details
PC Alone

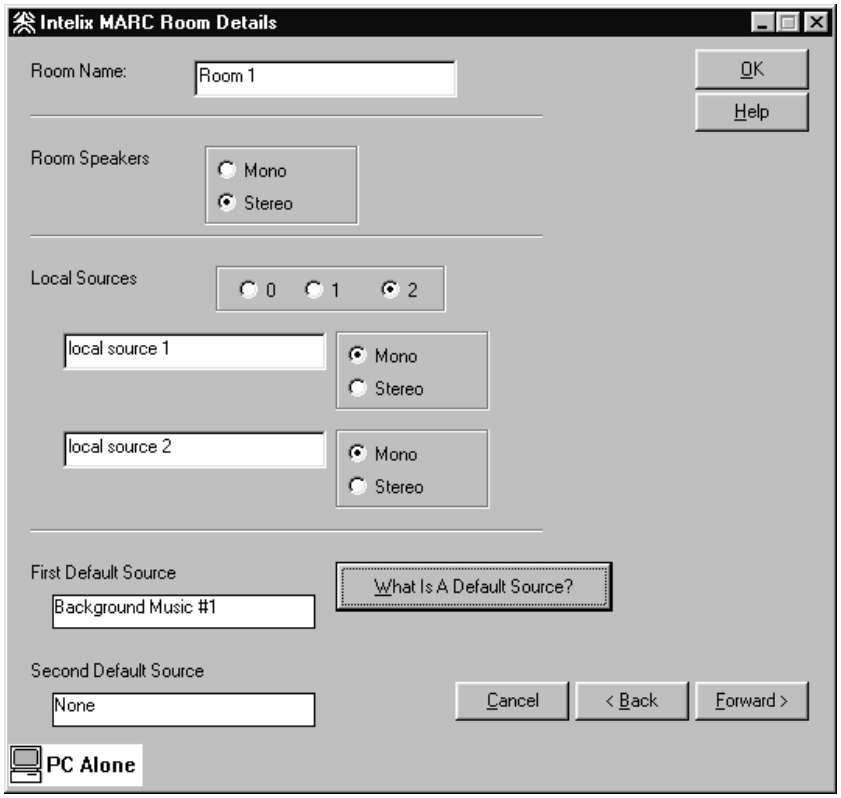
Room Details

Because the three rooms in this design have control stations that are very similar, we will use the “Room Details Template” option. This allows us to enter all the data that is shared by the three rooms only once, then customize the rooms as necessary. Click the “Room Details Template” button. The screen below appears. The screen as shown has already been completed for this project. Stereo is selected for room speakers, and the defaulat sources are set to “Background Music #1” and “none”.



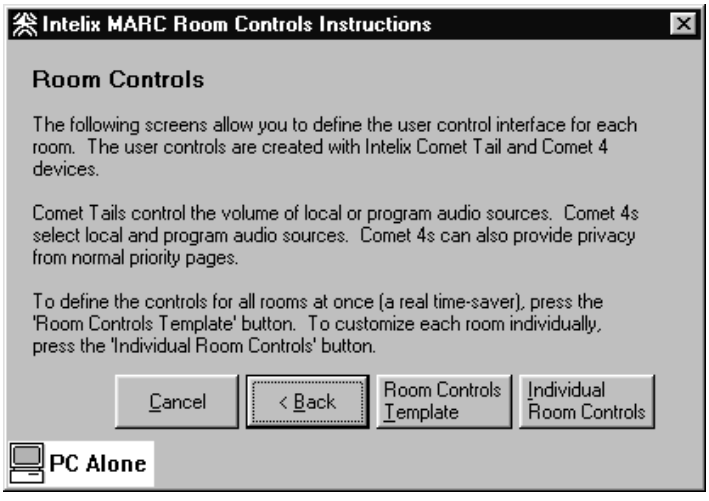
Individual Room Details

Now that we have defined all the room details that are common to all rooms in the group, we will define the details that differ among them. Click on the "Individual Room Details" button. The details screen for room 1 will appear. The only details that needs to be changed is that Room 1 has two local sources instead of one. Change the number of local sources to two by clicking the radio button for that selection. Now click Forward repeatedly skipping through rooms 2 and 3 to reach the Room Control screens.



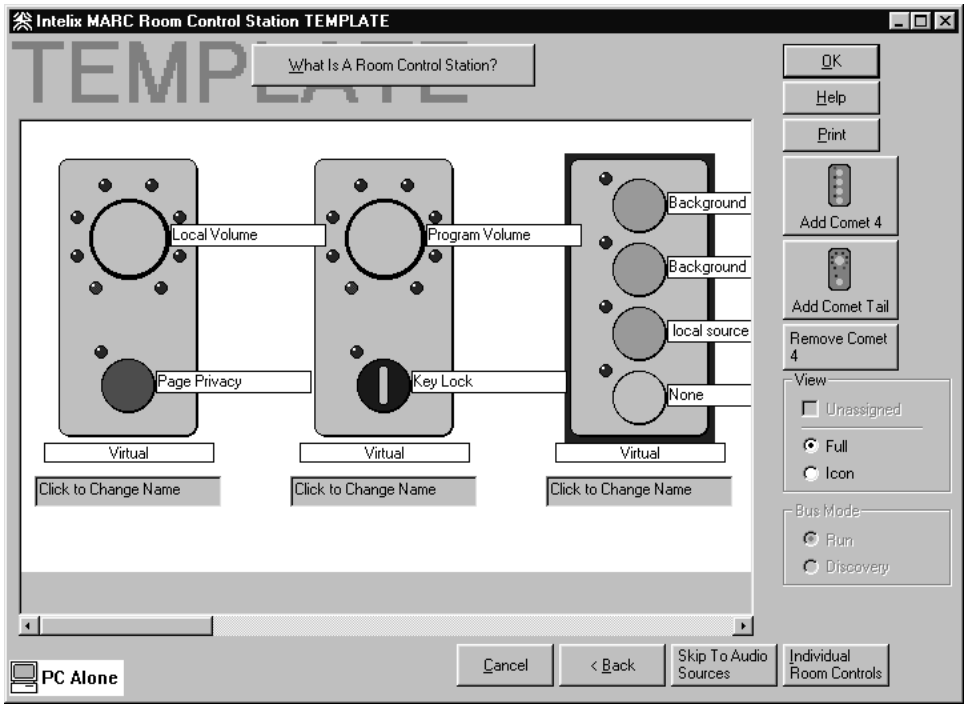
Room Control Stations

There are two room control screens. The first is explantory only (shown below), when you have read and understood the screen, click "Forward."

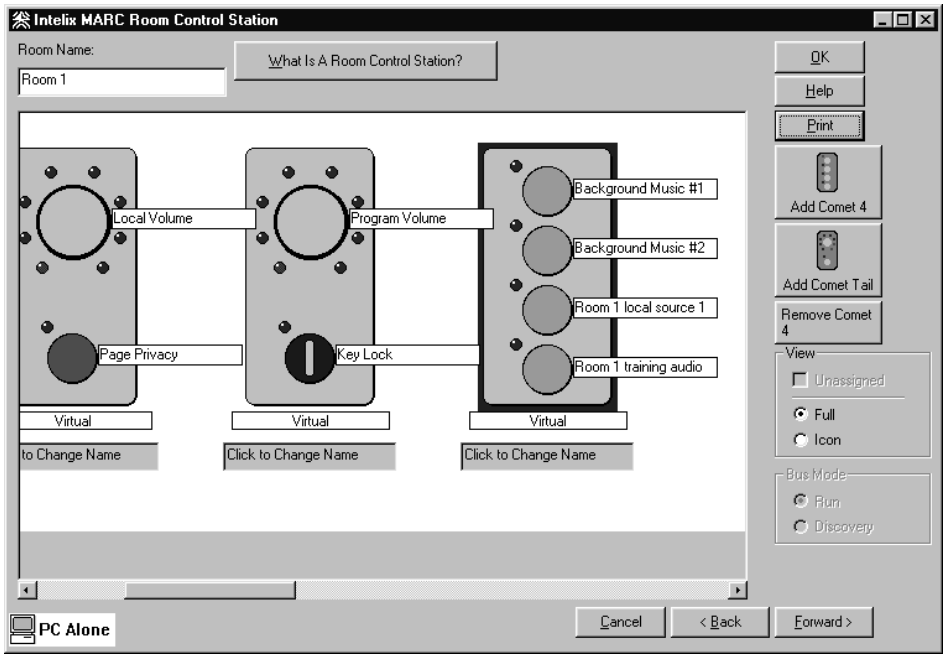

Intelix MARC Room Controls Instructions
Room Controls
The following screens allow you to define the user control interface for each room. The user controls are created with Intelix Comet Tail and Comet 4 devices.
Comet Tails control the volume of local or program audio sources. Comet 4s select local and program audio sources. Comet 4s can also provide privacy from normal priority pages.
To define the controls for all rooms at once (a real time-saver), press the 'Room Controls Template' button. To customize each room individually, press the 'Individual Room Controls' button.
Cancel
< Back
Room Controls Template
Individual Room Controls
PC Alone

Room Control Template

Because the three rooms in this design are similar, we will use a template to define the common elements. The screen below shows the template after these common items have been entered. Each station has two Comet Tails and one Comet 4. The buttons are defined as shown in the project definition. Only Room 1 differs from the template, since it has two local sources. This details will be changed in the next step. Click the "Individual Room Controls" button.

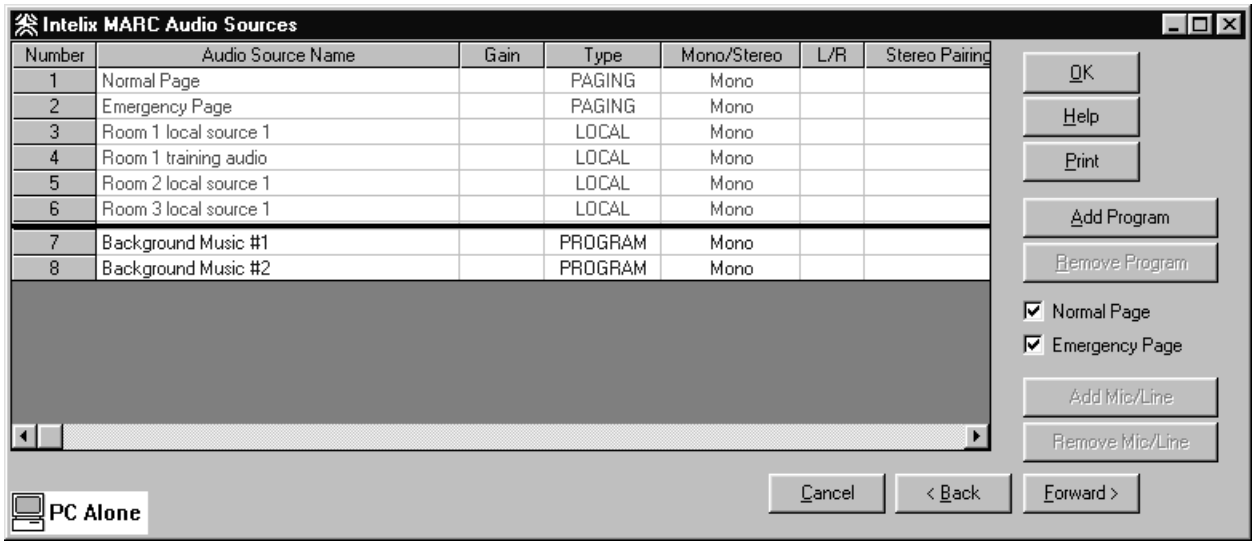


This screen shows the change to Room 1's room control station. The Comet 4 button that was labelled "unused" in the template is now assigned to the local source "Training Audio."



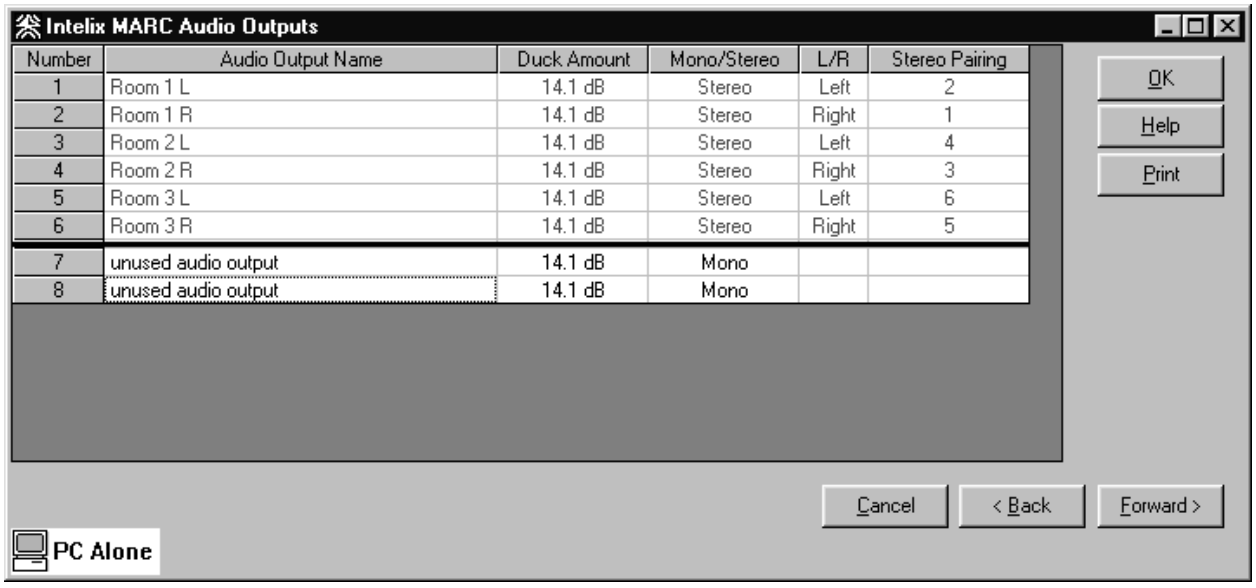
The Audio Sources Screen

This scren allows you to alter the characteristics of the audio sources in the project. You can change names, you can change the mono/stereo variable, you can add/delete program sources, you can add/delete mic/line cards. In this example we need do none of these functions. Press "Forward."



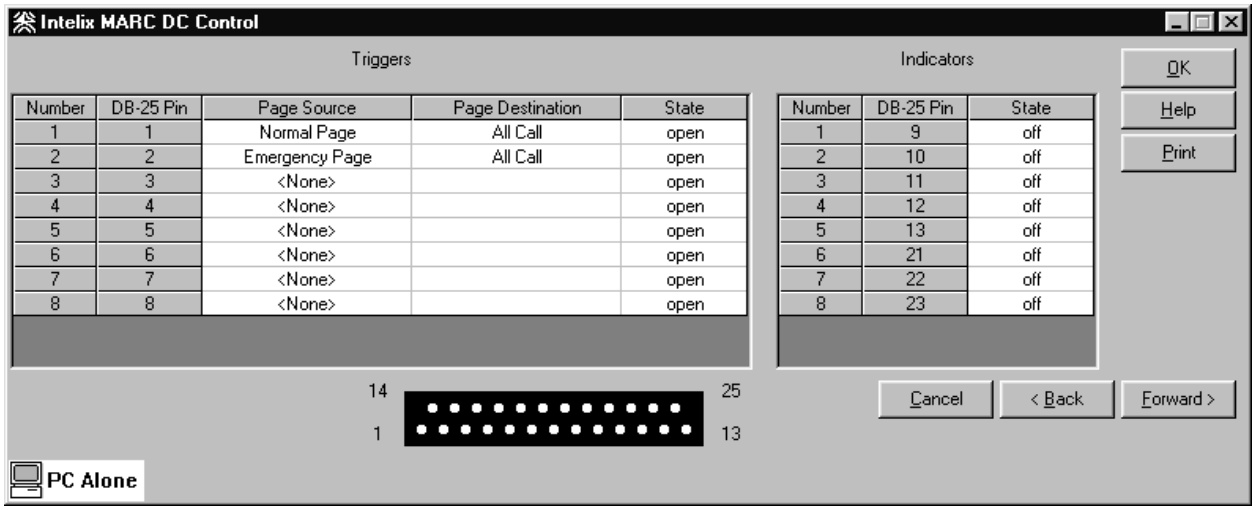
Audio Output Screen

This screen is primarily informational, but allows the modification of the name and duck amounts of outputs. Duck amount is the amount that program sources will be lowered when a page occurs. This amount can be set on a per output basis. Click on the duck amount, type the new value and press Enter. For this example we accept the default levels and leave the names unchanged. Click "Forward."


Intelix MARC Audio Outputs
Number
Audio Output Name
Duck Amount
Mono/Stereo
L/R
Stereo Pairing
1 Room 1 L 14.1 dB Stereo Left 2
2 Room 1 R 14.1 dB Stereo Right 1
3 Room 2 L 14.1 dB Stereo Left 4
4 Room 2 R 14.1 dB Stereo Right 3
5 Room 3 L 14.1 dB Stereo Left 6
6 Room 3 R 14.1 dB Stereo Right 5
7 unused audio output 14.1 dB Mono
8 unused audio output 14.1 dB Mono
OK
Help
Print
Cancel
< Back
Forward >
PC Alone

DC Control

This screen allows you to direct paging sources to selected areas of the design. In this example we are leaving normal and emergency pages as “all call”; i.e. all pages are routed to all rooms. The state columns allow simulation of contact closures when you are connected to a MARC matrix mixer.

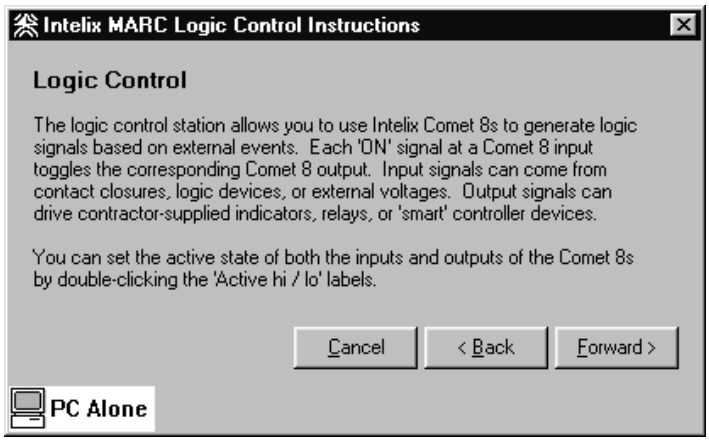


Number	DB-25 Pin	Page Source	Page Destination	State
1	1	Normal Page	All Call	open
2	2	Emergency Page	All Call	open
3	3	<None>		open
4	4	<None>		open
5	5	<None>		open
6	6	<None>		open
7	7	<None>		open
8	8	<None>		open

Number	DB-25 Pin	State
1	9	off
2	10	off
3	11	off
4	12	off
5	13	off
6	21	off
7	22	off
8	23	off

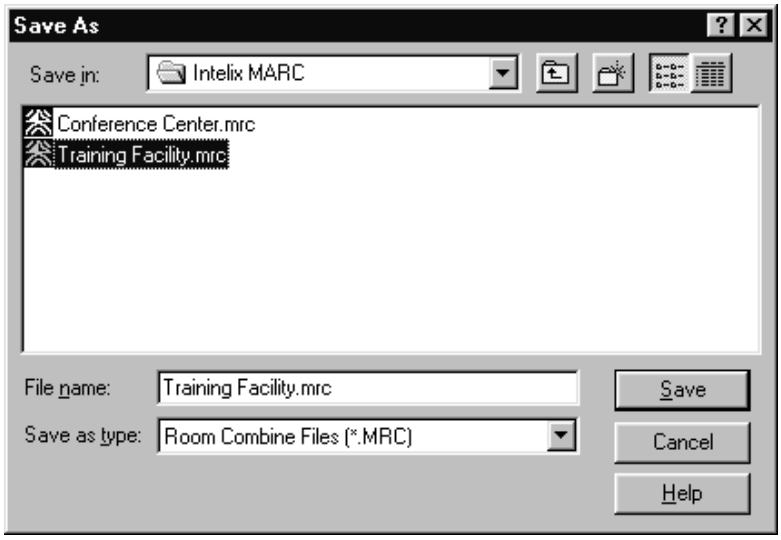
Logic Control

The logic control screen is used to add hardware to a system that requires triggering of external equipment; e.g. relays, lighting equipment etc. Our example requires no logic control stations. Click “Forward.”


Intelix MARC Logic Control Instructions
Logic Control
The logic control station allows you to use Intelix Comet 8s to generate logic signals based on external events. Each 'ON' signal at a Comet 8 input toggles the corresponding Comet 8 output. Input signals can come from contact closures, logic devices, or external voltages. Output signals can drive contractor-supplied indicators, relays, or 'smart' controller devices.
You can set the active state of both the inputs and outputs of the Comet 8s by double-clicking the 'Active hi / lo' labels.
Cancel
< Back
Forward >
PC Alone

Saving the File

You will now be prompted for a file name. We have used "Training Facility" for this example. Click OK.



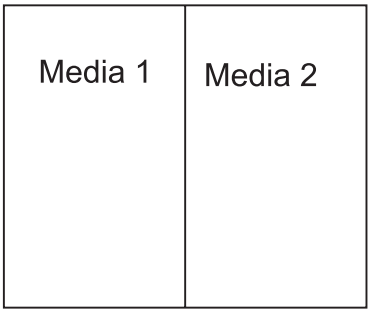
Completing the Design Wizard

You have now completed the MARC design wizard. You may return to the main menu, view the sales report or proceed to the hardware installation wizard.

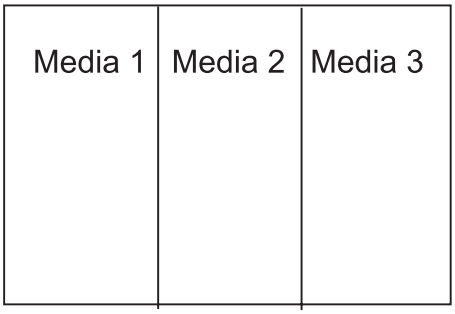
Intelix MARC End Of Auto Design Wizard
You have reached the end of the Intelix MARC Auto Design Wizard.
What do you want to do now?
Return to Main Screen
Check Sales Report
Hardware Installation
PC Alone

Appendix H: MARC Conference Center Design Example

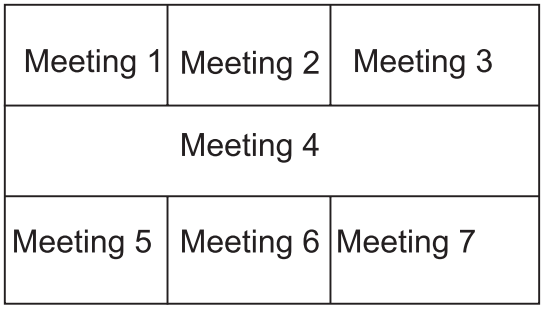
This design example demonstrates how to use the MARC designer software to implement a more complex design. This design is for a conference cent which contains three room groups (an RC-2, an RC-3row and an RC-7) as shown below. On the next page are the design specifications.
By totalling the inputs (24) and outputs (14) from the specification sheet, we see that the design will require a MARC24L16L matrix mixer.
The system will require three separate room combine panels; one for each room group.



Media Suite



Seminar Suite



Meeting Suite

Conference Center Specifications

Program Sources:
1) Background Music #1
2) Background Music #2
3) Normal Page
3) Emergency Page
Total Program inputs: 4

Local Sources:

Meeting Rooms 1-3, 5-7: two monaural local source each	12
Meeting Room 4: one monaural local source	1
Seminar Rooms 1-3: one monaural local source each	3
Media Rooms 1-2: two stereo local sources each	4
Total local source inputs:	20

I/O Totals
Total all audio inputs: 24 (20 local sources, 4 program sources)
Total all audio outputs: 14 (meetings suite 7, seminar suite 3, media suite 4)

Room Control Stations:

Meeting Rooms 1-7

Local Volume control	1 Comet Tail
Program Volume control	1 Comet Tail
Four source selection buttons	1 Comet 4
Station Key Lock	
Page Privacy	

Seminar Rooms 1-3

Local Volume control	1 Comet Tail
Program Volume control	1 Comet Tail
Four source selection buttons	1 Comet 4
Station Key Lock	
Page Privacy	

Media Rooms 1-2

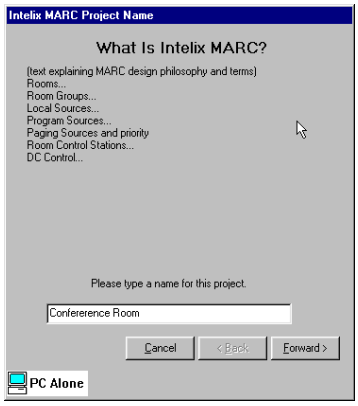
Local Volume control	1 Comet Tail
Program Volume control	1 Comet Tail
Four source selection buttons	1 Comet 4
Station Key Lock	
Page Privacy	

Default Sources:
Meeting Rooms 1-7 — Background Music #1
Seminar Rooms 1-3 — local sources
Media Rooms 1-2 — Background Music #1

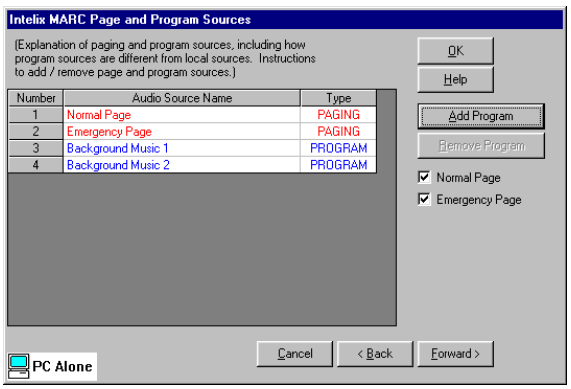
Implementing the Conference Center with the Auto Design Wizard

1) Start the MARC Designer Software
2) From the File Menu, select "New". You will be asked to confirm the running of the Wizard. Click OK. Below are the steps in the design wizard with illustrative screens shown.

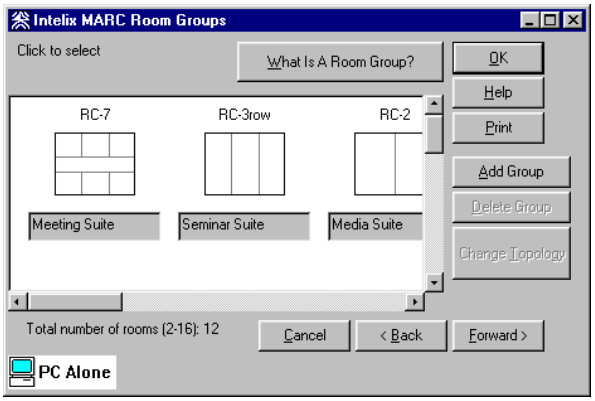
Name the project by typing the name in the name box. At right you see the screen with the name "Conference Center" filled in. Click the "Forward" button.



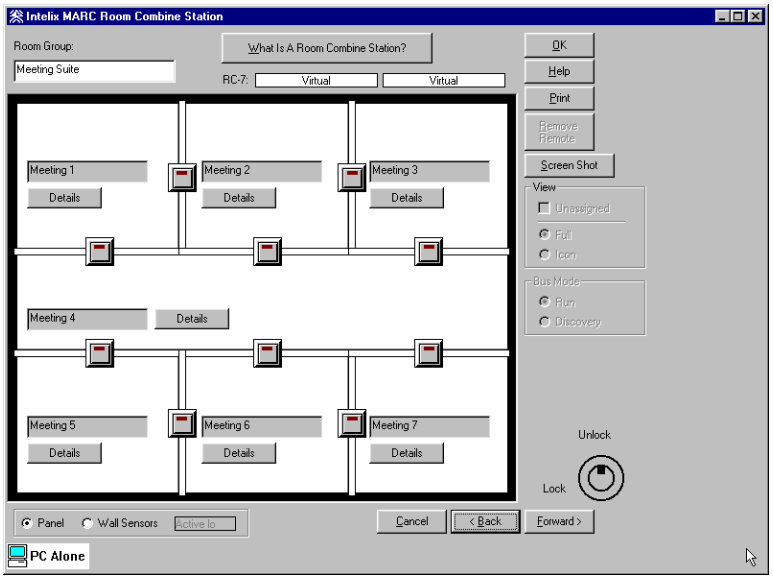
The page and program source screen allows the selecting and naming of sources. Here we check normal page and emergency page as specified in the project specifications. We name the two background music sources, and delete the two unused program sources, using the "Delete Source" button.



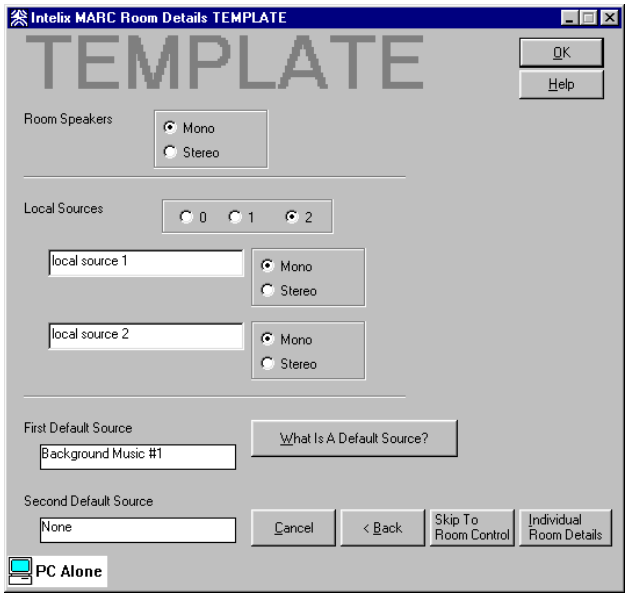
The Room Groups screen allows the selection of topologies for each of the three room groups. As shown on the first page of this example, there is an RC-2, an RC-3row and an RC-7 group. Select each group and change its topology to the required one (with the "Change Topology" button). You will need to add a third group, using the "Add Group" button. Name each group by typing its name in the name box. The completed room groups screen is shown at right.



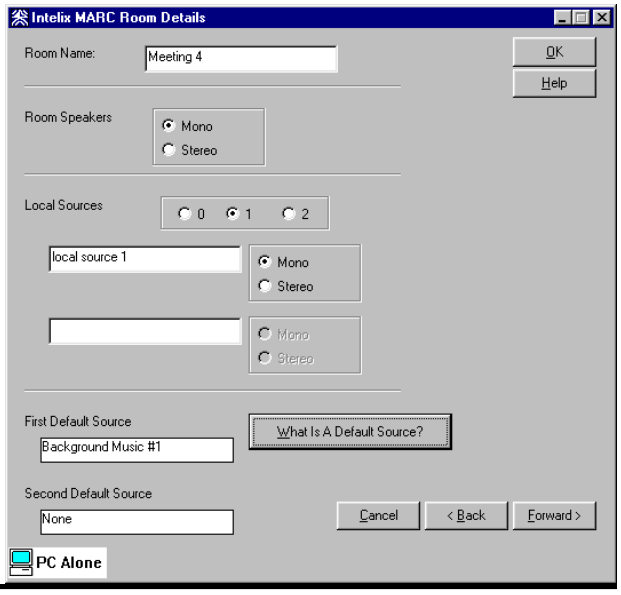
Name the rooms in each group, using unique names to avoid later confusion. Type the name in each name box. As you finish each group, click "Forward" and the next group will appear. The name screen for the Meeting group is shown at right. Seminar and Media names are not shown. Click the "Forward" button.



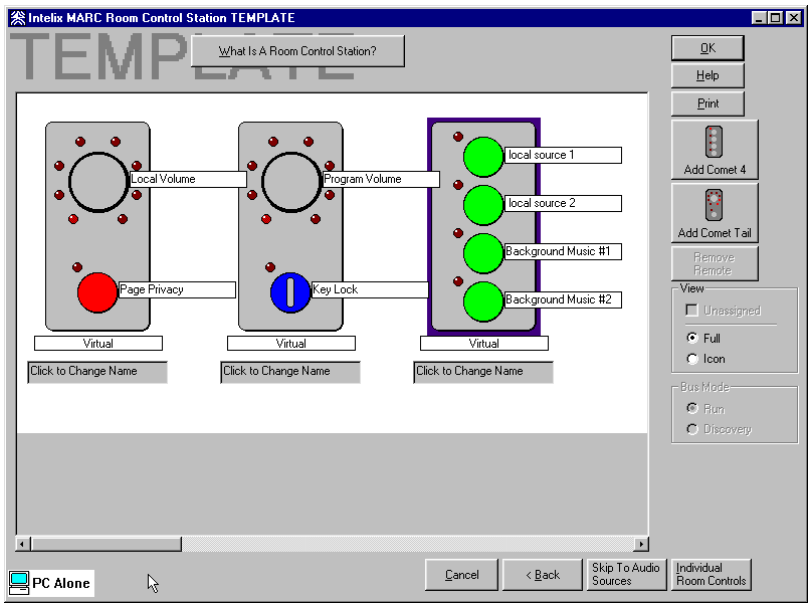
We have taken the "Room Details Template" path in this design. As can be seen from the specification page, most rooms have similar details. We will set up those details as a template for all rooms, then change the exceptions in the next step. The finished template is shown at right. From this screen we will skip to "Individual Room Details" which is where we can alter the rooms whose details do not conform to the template.



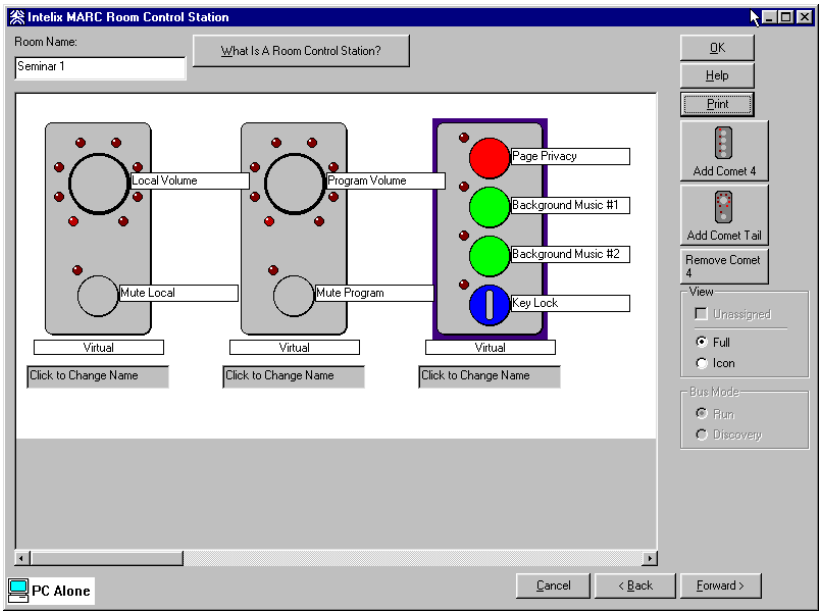
This screen shows Meeting Room 4 which unlike all the other Meeting Group rooms has only one local source. We have stepped through Meeting Group rooms 1-3 without change to get to this room that requires a change from the template. After this we must change the Seminar Room details which require that the default sources are the local sources. Also the Media Group rooms have stereo speakers and local sources.



Similarly to the room details process, we select the Templates option for room control stations. All of our room control stations contain two Comet Tails and one Comet 4 (as per the specification page). The template screen at right shows the template with all functions configured. This configuration can be used unmodified for Meeting and Media groups, but must be modified for the Seminar Group (shown in the next step). Click on the "Individual Room Controls" button.



This screen shows the finished room control group for Seminar Room 1. All three Seminar rooms have their room control stations configured like this. Rooms in the Media group can use the control station template intact, and so do not need to be changed.



Neither the Audio Inputs screen nor the Audio Outputs screens need to be changed in this design. All pages, both normal and emergency are routed to all rooms, so no change is needed on the DC control screen. Likewise this design does not contain any logic control stations, so click the "Finish" button on the logic control screen. You will be prompted for a file name in which to save your design. This name can be different than the design's name on the first screen, but that name is used as a default. After the save is complete, the design is complete and you may choose the main screen, the hardware installation wizard or Sales report.

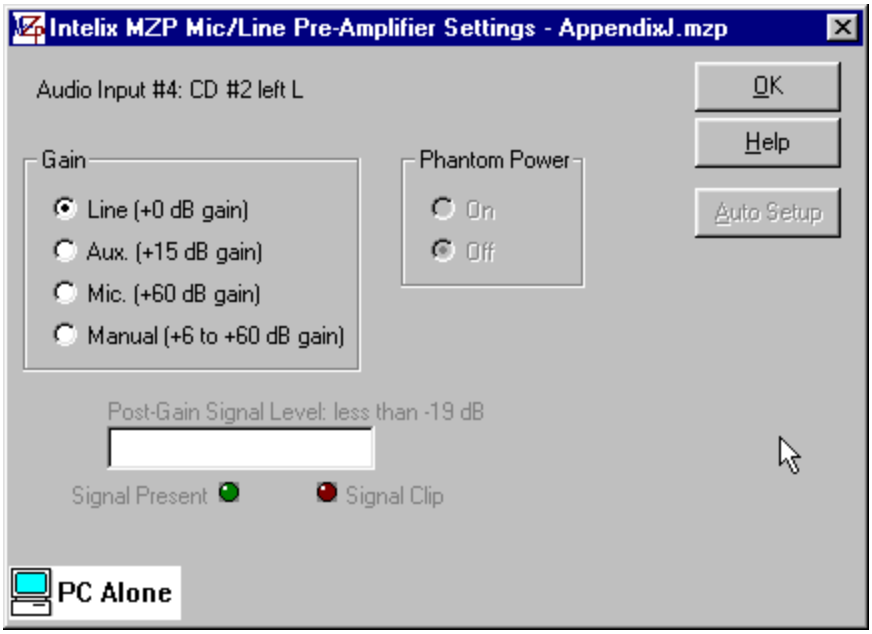
Appendix I: The Mic/Line Card

The mic/line card is a hardware option for the Intelix matrix mixer product line. It provides an 8 channel preamplifier with software controllable characteristics. Among these characteristics are:

1) Four gain ranges
    a) “line” range: no amplification
    b) “aux” range: +20 dB amplification
    c) “mic” range: +60 db amplification
    d) “manual” range: screwdriver adjustment 0db – +60db
2) Phantom power available on a per channel basis (+15V)
3) Signal present and signal peak LEDs on a per channel basis.
4) Each channel has a signal sensor which is capable of sensing -20 to +24 dB. This sensor is readable in software.

The mic/line card has auto-sensing capabilities. This means that when put in auto mode, the card examines the specified input and sets its input range to the optimum settings for that input and notifies the user of the new settings.

Software provides a signal meter for each of the 8 channels.



This screen shot shows the MARC control software for the mic/line card. Note the selectable range, phantom power, auto setup selection signal level meter, and signal present and clip LEDs.

Appendix J: Troubleshooting RS232 Communication

Use the following procedures to troubleshoot communication problems between the PC and the MARC matrix mixer.

Be sure that you have completed the steps below:

1) **Install the MARC software from the supplied CDROM to your PC**.
2) **Start the MARC software** (see section 5.0). From the main menu select Communication -> Communication Setup.
3) **Configure the PC Communication port for details see sections 5.3-5.6.**

Communication Icons

All MARC screens carry a communication icon in the lower left corner. The icon in the lower left corner will indicate the current state of communication. There are three communication icons:

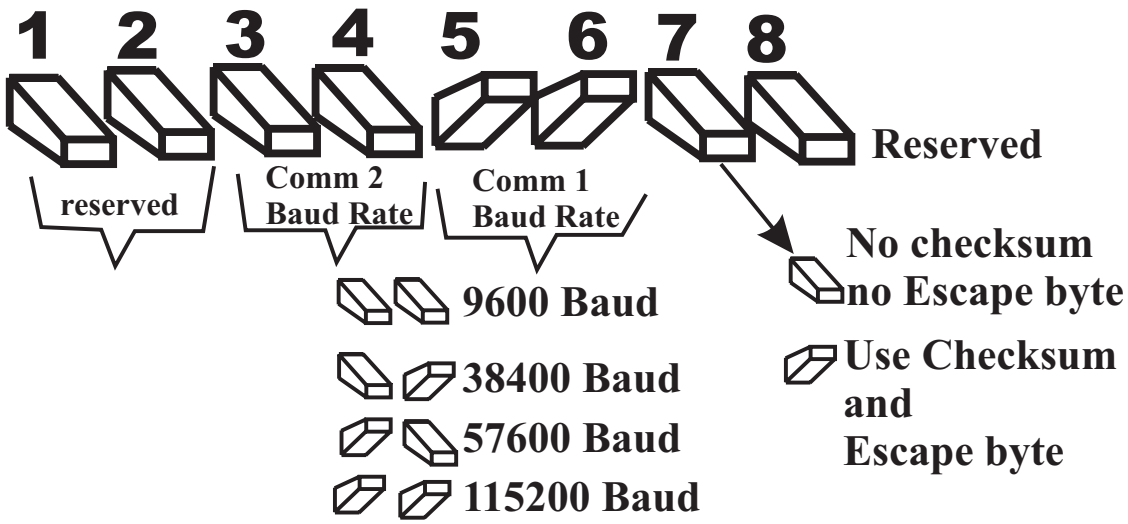
This icon indicates that the PC is not attempting to communicate with an MARC matrix mixer. In this mode you can create new files and design systems for later transfer to an MARC. In PC alone mode some functions may be disabled.

This icon indicates correct communication between the PC and the MARC. You can transfer files, monitor the MARC or make live real time changes in this mode.

This icon indicates a communication failure. Common causes are incorrect communication port selected, incorrect baud rate, or cabling errors.

DIP Switches

The settings of the DIP switches on the rear of the matrix mixer (shown below) *must agree* with the baud rate setting in software (Main -> Communication -> Settings -> Baud Rate).



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